Volume 6 / Number 6 / 2012 ISSN 1840-2291

HealthMED

Journal of Society for development in new net environment in B&H

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ISSN 1840-2291

design by Almir Rizvanovic

Volume 6 / Number 6 / 2012

HealthMED

Journal of Society for development in new net environment in B&H

Address of theSarajevo, Bolnicka BB
Editorial Board phone/fax 00387 33 956 080
healthmedjournal@gmail.com
http://www.healthmedjournal.com
Published by DRUNPP, Sarajevo
Volume 6 Number 6, 2012
ISSN 1840-2291

HealthMED journal with impact factor indexed in:

- Thomson Reuters ISI web of Science,
- Science Citation Index-Expanded,
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Body composition measurements determined by air displacement plethysmography and eight-polar bioelectrical impedance analysis are equivalent in African American college students

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Abstract

The purpose of this study was to compare body composition measurements taken with air displacement plethysmography (BOD POD) to eight-polar bioelectrical impedance analysis (BIA) in African American college students. The 143 subjects, aged 17–39 years, visited the participating Human Performance & Leisure Studies laboratory at North Carolina A&T State University, Greensboro, NC, United States, between June 1, 2011 and December 31, 2011. Measurements of body composition, including fat mass (FM), fat free mass (FFM), and % body fat were determined using BOD POD (Life Measurement Inc., California, USA) and an eight-polar BIA (Inbody-720, Biospace, Seoul, Korea). The relationships between body composition measurements taken using BOD POD and eight-polar BIA were assessed using Pearson's r correlation. Results showed that body composition measurements taken using the BOD POD and the eight-polar BIA correlated significantly with respect to FFM (male, r=0.911, p<0.001; female, r=0.918, p<0.001); FM (male, r=0.938, p<0.001; female: r=0.931, p<0.001); and % body fat (male, r=0.871, p<0.001; female, r=0.717, p<0.001). The authors concluded that measurements taken using BOD POD and eight-polar BIA were similar in African American students. These methods are useful for field tests requiring body composition measurements and can be used interchangeably in the field.

Key words: Air-displacement plethysmography, eight-polar bioelectrical impedance analysis, Fat free mass, Fat mass, African American

Introduction

Body composition, such as fat free mass (FFM) and fat mass (FM), is an essential parameter in exercise training for athletes and non-athletes because low fat and high muscle can improve exercise performance in many types of sports and recreational activities. Many studies have reported on traditional measurements of body condition via body mass index (BMI), waist-hip ratio (WHR), waist circumference (WC), and skin-fold thickness (1–3). Recently, several studies introduced the measurement of body composition by magnetic resonance imaging (MRI), dual energy x-ray absorptiometry (DEXA), underwater weighing (densitometry), dilution techniques, bioelectrical impedance analysis (BIA), and air-displacement plethysmography (BOD POD) (4–6). Although these measurements are reliable and show validity, MRI, DEXA, densitometry, and dilution techniques are very expensive and inconvenient for the participants, and not feasible to conduct in the field because they require large specialized equipment. For these reasons, the use of these techniques is limited in many studies. By contrast, measurements using BIA and BOD POD are relatively simple, require only a few minutes to complete, and are non-invasive. Further, these methods deliver reliable measurements of body composition (5–6). Studies have compared the measurements of body composition parameters, such as FM, FFM, and % body fat, among simpler methods such as BIA and BOD POD and more complex methods such as DEXA, MRI, and densitometry. Studies com-

paring BOD POD and DEXA have shown that the correlation between BOD POD and DEXA in predicting FM and FFM was very close to 1.00, ranging from 0.99 to 1.02 (7–9). A good correlation between BIA and DEXA in predicting FM and FFM was also shown (10–11).

Most of the previous studies of BOD POD and BIA have compared the accuracy of simple measuring methods, such as BOD POD and BIA, to more complex methods. Data comparing BOD POD and BIA to each other are lacking. In addition, previous studies on BIA were conducted using four-polar BIA with a single impedance frequency but not eight-polar BIA or impedance at multiple frequencies. Furthermore, very few of these studies have been conducted on the African-American ethnic minorities (11). Therefore, the purpose of this study was to compare measurements of body composition parameters, such as FM, FFM, and % body fat, between BOD POD and eight-polar BIA in African American college students.

Methods

Subject

The study cohort comprised 143 African American college students (64 males, 79 females), aged 17–39 years, who visited the participating Human Performance & Leisure Studies laboratory at North Carolina A & T State University in Greensboro, NC, USA between June 1, 2011 and December 31, 2011. The FFM, FM, and % body fat of all subjects were determined via eight-polar BIA with impedance at multiple frequencies (Inbody720, Seoul, Korea) and BOD POD (Life Measurement Inc., Concord, California, USA). All study procedures were approved by the Institutional Review Board at North Carolina A & T State University.

Experimental procedures

The FFM, FM, and % BF were evaluated using an eight-polar BIA with multiple impedance frequencies (Inbody720, Seoul, Korea) and BOD POD (Life Measurement Inc., Concord, California, USA). The BIA instrument measures the resistance of the right arm, left arm, trunk, right leg, and left leg at 6 frequencies, (1, 5, 50, 250, 500, and 1000 kHz) via 30 impedance measurements in each of the 5 sites. The device uses 8 tactile electrodes: 2 in contact with the palm and thumb of each hand, and 2 with the anterior and posterior aspects of the sole of each foot (12). Subjects wore light clothing and removed all metal items that could interrupt the electronic current during the measurements.

The BOD POD instrument takes measurements using chamber pressure amplitudes, which were calibrated before each test by using a 50-L calibration cylinder. The subjects wore a tight-fitted swimsuit or body suit, and the FFM, FM, and % BF was determined in the chamber. The thoracic gas volume was measured in a separate step, in which the subject was required to sit quietly in the BOD POD chamber and breathe through a disposal tube and filter connected to the reference chamber at the rear of the BOD POD apparatus. After 4 or 5 breaths, the airway was occluded midway during exhalation, and the subject was instructed to blow 3 quick, light, panting breaths into the tube.

Before taking measurements, the subjects were prohibited from performing any exercise for 12 h, consuming anything for 4h, and urinating just before the impedance measurement. All methods employed for assessing body composition followed recommended guidelines (13).

Statistical analysis

All results from this study are represented as mean ± standard deviation. Pearson's r correlations were calculated to examine the relationship between BOD POD and BIA with FFM, FM, and % body fat. Statistical significance was set at $p < 0.05$, and all analyses were performed using SPSS version 18.0 (SPSS, Chicago, IL, USA).

Results

The characteristics of the subjects are shown in Table 1. The average ages of the males and females are 21.66 ± 2.99 years and 19.99 ± 2.83 years, respectively; their average heights are 176.95 ± 6.86 cm and 166.76 ± 8.80 cm, respectively; their average weights are 81.78 ± 14.97 kg and 69.94 ± 14.04 kg, respectively; their average BMIs are 26.11 ± 4.41 kg/m^2 and 25.04 ± 4.05 kg/m^2, res-

pectively; their average waist circumferences are 83.88 ± 9.89 cm and 81.26 ± 9.80 cm, respectively; their average hip circumference are 97.36 ± 8.63 cm and 99.06 ± 10.32 cm, respectively; and their average neck circumference are 38.07 ± 2.28 cm and 32.29 ± 1.99 cm, respectively.

The relationship between BOD POD and eight-polar BIA with respect to FFM, FM, and % body fat measurements are shown in Table 2. BOD POD showed significant positive correlations with eight-polar BIA in FFM (male, r=0.911, p<0.001; female, r=0.918; p<0.001), FM (male, r=0.938, p<0.001; female, r = 0.931, p<0.001), and % body fat (male, r=0.871, p<0.001; female, r=0.717, p<0.001).

Discussion

This study evaluated the correlation between BOD POD and eight-polar BIA in African American college students. The results of this study demonstrated a significant correlation between BOD POD and eight-polar BIA measurements obtained for FFM, FM, and % body fat.

The BOD POD and BIA methods have been widely used in clinics, in sports medicine, in public health centers, and in weight reduction programs (14–16). Many studies have compared predictions of body composition by BOD POD and BIA with measurements made by reference methods such as DEXA and CT (17–19), but, to our knowledge, comparisons of BOD POD and BIA have not yet been reported. This is the first investigation to compare estimations of FFM, FM, and % body fat between BOD POD and eight-polar BIA in African American college students.

Our results showed significant correlations in the measurements taken for FFM, FM, and % body fat between BOD POD and BIA. These observations indicate that although BOD POD is based on the principles of densitometry and BIA is based on the principles of bioelectrical impedance, these methods give similar outputs regarding these body composition parameters. This study shows not only a significant correlation between BOD POD and BIA but also that BOD POD and eight-polar BIA give measurements very close to that of DEXA (7–11). Based on these results, we conclude that BOD POD and eight-polar BIA are useful methods for field testing that requires wide scale use of body composition measurements, and that these methods can be used interchangeably in field.

This study has some limitations. Since the students were recruited from only 1 historically black college and university (HBCU) in Greensboro, NC, USA, the study population did not represent the entire African-American population. Further-

Table 1. Characteristics of subjects (N = 143)

Variable	Male (N = 64)	Female (N = 79)
Age, years	21.66 ± 2.99	19.99 ± 2.83
Height, cm	176.95 ± 6.86	166.76 ± 8.80
Weight, kg	81.78 ± 14.97	69.94 ± 14.04
Body mass index, kg/m^2	26.11 ± 4.41	25.04 ± 4.05
Waist circumference, cm	83.88 ± 9.89	81.26 ± 9.80
Hip circumference, cm	97.36 ± 8.63	99.06 ± 10.32
Neck circumference, cm	38.07 ± 2.28	32.29 ± 1.99

Table 2. The relationship between BOD POD and BIA with FFM, FM, and %body fat in African American (N = 143)

Male (N = 64)	BOD POD	INBODY	r	p
Fat free mass (kg)	65.76 ± 7.61	68.08 ± 8.76	0.911	<0.001***
Fat mass (kg)	15.99 ± 9.90	13.69 ± 8.14	0.938	<0.001***
Body fat (%)	18.49 ± 8.45	15.81 ± 7.07	0.871	<0.001***
Female (N = 79)	BOD POD	INBODY	r	p
Fat free mass (kg)	51.55 ± 7.82	51.64 ± 8.78	0.918	<0.001***
Fat mass (kg)	18.33 ± 9.69	18.31 ± 9.24	0.931	<0.001***
Body fat (%)	25.12 ± 8.83	24.97 ± 8.37	0.717	<0.001***

****p<0.001 by Pearson's r correlations analysis*

more, it comprised only a few a small number of students (N = 143). However, we believe the greatest merits of this research are that it was conducted on subjects from the African-American ethnic minorities and that this is the first study to compare BOD POD and eight-polar BIA with multiple frequencies of impedance.

Conclusion

We concluded that the data of BOD POD and the data of eight-polar BIA were strong significantly correlated in African American students. These methods are useful methods in field test for measuring body composition and it can be used interchangeable in field.

Acknowledgements

This work was supported by a research grant from Seoul Women's University (2012).

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An analysis of children's thoughts about the nursing profession using the method of having children draw pictures

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Abstract

Purpose: The research was carried out for the purpose of analyzing the thoughts of children, ages 11-13, about the professions of nursing, using the method of having children draw pictures.

Materials and Methods: The study was of descriptive design and the research universe comprised pupils in the second tier (6th, 7th, and 8th grades) of a primary school located in the Esenler District of Istanbul. Sample size was calculated with the familiar sample formula and on the day of the study, 147 willing students who were present that day were accepted into the study group. Data was collected using a Questionnaire that consisted of 10 questions related to the children's socio-demographic characteristics and the topic of the research. To determine the children's thoughts on the nursing profession, the students were asked to draw the first thing that came to their minds when they heard the word "nurse." The pictures the children drew were analyzed in terms of the children's positive/negative concepts about the role of the nurse and about nurses in general. The data was analyzed in terms of descriptive statistics (percentages, means) and evaluated using the chi-square test.

Results: The mean age of the children in the study was 12.00 ± .82 and 54.4% were girls. Of the children, 58.5% stated that they had never been hospitalized and 78.2% said they had no acquaintances who worked as a nurse. When the drawings were examined, it was found that 68.7% of the children had included the figure of a nurse, 70.7% had depicted the therapeutic role of nurses in their drawings, and 83.2% were found to have positive thoughts about the nursing profession. It was determined that there was a significant difference in children's thoughts about nurses according to their genders and whether or not they were acquainted with an actual nurse ($p<0.05$).

Conclusion: The children in the study mostly reflected the therapeutic role of the nurse in their drawings, and it was found that girls in particular and also children who knew people who were nurses had more positive thoughts about nurses.

Key words: children, nurses, drawings, drawing pictures

Introduction

The Law on Nursing (2007) defines a nurse as an authorized health professional who is responsible for performing the duties of planning, implementing, controlling and evaluating the nursing care that will answer the health needs of individuals, families and the community as regards health issues that may be addressed through nursing interventions. In this context, the area of service of the nursing profession encompasses the individual, the family, and the community (Özsoy 2000).

The status of a profession is associated with the way society perceives that profession (Özsoy 2000). How an individual perceives a nurse is directly proportionate to his/her expectations from nursing, previous experiences, other people's opinions, and the image of nursing as reflected in the mass media. Childhood is a period where everything is experienced for the first time and the impact of these experiences survive a lifetime. In childhood, a child's perception of a nurse is more influenced by the child's own experiences (Slusarska et al 2004).

A pediatric nurse must realize that children's physical, physiological and psychological needs are different from those of adults and perceptive

senses have not yet developed, but that children are in fact in constant development and their perception of and reaction to sickness varies according to chronological age and developmental characteristics. The nurse should know that the child needs family-centered care and should be able to use verbal and non-verbal communication techniques appropriate to the child's age and stage of development. Most important is to love children and to treat them with sincerity (Çavuşoğlu 2001). When all of these factors are considered, the importance of the qualifications nurses need in working with children can be clearly seen.

To make changes in the status of the profession and encourage positive insights about nurses among the population, the feelings and thoughts of children should be taken into consideration. Children have more difficulty expressing their feelings and thoughts compared to adults (Clatworthy, Simon ve Tiedeman 1999). One of the methods frequently used to interpret children's feelings and perceptions makes use of the art of drawing (Johonson 1990). The fact that children like to draw pictures (Yavuzer 2003) places the art of drawing in a very special position in terms of being more able to understand what children mean to express (Yurtal ve Artut 2008).

The method of having children draw pictures may be useful in determining how children perceive nurses. This method may provide the means to explore children's positive/negative thoughts about nursing, the image in their mind about the nursing profession, their experiences in this context, and the impressions these experiences have left with them. Such an approach would make it possible to plan interventions designed to support positive thoughts and eliminate negative thoughts and feelings.

Knowing how children perceive nurses and nursing is important in terms of providing guidelines for planning and implementing nursing practices. This study was thus designed to analyze the thoughts of children, 11-13, about the profession of nursing, using the method of drawing pictures.

Materials and methods

Type of Research: The research was a descriptive study carried out for the purpose of analyzing the thoughts of children, ages 11-13, about the profession of nursing, using the method of having children draw pictures.

Universe and sample: The universe of this study, designed as descriptive research, was the group of students in the second tier (6^{th}-7^{th}-8^{th} grades) of a primary school located in Istanbul's Esenler district. Sample size was calculated using the familiar sample formula. One hundred and forty-seven students in the age group 11-13 who were attending school during the days the research was carried out (April 21-25, 2011) and who were willing to participate comprised the sample for the study.

Data collection tools: Data was collected with a Questionnaire consisting of a total of 10 questions related to the children's socio-demographic characteristics (whether they had ever been hospitalized, whether they had ever been acquainted with a nurse, etc.) and the topic of the research. In order to understand the pupils' thoughts about the nursing profession, they were asked to draw the first thing that came into their minds when they heard the word "nurse."

Research questions: Answers were sought to 3 questions appropriate to the design of the study:

1. What was the image of nurses that came through in the children's drawings?
2. What role did the nurses have in the pictures that the children drew?
3. Was there an association between the children's socio-demographic characteristics and the image of nurses in their pictures?

Evaluation of the drawings: The children's drawings were reviewed in terms of the positive and negative thoughts that were reflected about nurses and their roles, the features of the objects drawn in the pictures, and the gender of the nurses that appeared in the drawings.

Statistical evaluation: Data was evaluated in the electronic medium using the package program SPSS 11.5 and descriptive statistics (percentages, means) as well as the chi-square test.

Ethical matters: The written permission of the Provincial National Education Directorate was obtained in order to be able to carry out the project at the chosen school. The verbal consent of the students in the study was also obtained. The principle of volunteer participation was adopted.

Research limitations: Since the research was conducted with children in only one school, the results cannot be generalized to the whole of the province of Istanbul. A larger sample group, as well as qualitative studies based on different variables (the effect of the mass media on the image of the nurse), focus group and in-depth interviews are needed if a generalization is to be made. Another factor was that the study was carried out during school hours and in the school environment. Restricting the time to one hour may have diminished the originality of expression in the drawings. In addition, the fact that the children drew the pictures simultaneously in the same room may have resulted in their influencing each other. Moreover, since not too many published studies or data were accessible on this subject, this became a shortcoming in the evaluation process.

Results

Of the children in the study, 34% were 12 years old, 34% were in the 7th grade and 54.4% were girls. Most of the mothers (80.3%) and fathers (73.5%) of the children were primary school graduates, more than half of the children (58.5%) had never been hospitalized, and most (78.2%) had not been acquainted with any nurses (Table 1).

When the different features of the children's drawings were considered, it was found that 70.7% drew nurses as treatment-providers (e.g., Figure 1), 68.7% drew the figure of a nurse in their pictures; 83.2% of those that drew nurses depicted them positively. Additionally, 84.2% of the children depicted nurses as female, 15.8% as male (Table 2).

Figure 1. Drawing of nurse's therapeutic role (Girl, 13 years)

Table 1. Children's Socio-demographic Characteristics (N=147)

Characteristics	Number (n)	Percentage (%)
Age		
11	48	32.7
12	**50**	**34.0**
13	49	33.3
Grade		
6th grade	48	32.7
7th grade	**50**	**34.0**
8th grade	49	33.3
Gender		
Girls	**80**	**54.4**
Boys	67	45.6
Mother's Education		
Illiterate	6	4.1
Literate	7	4.8
Primary School	**118**	**80.3**
High School	14	9.5
University	2	1.4
Father's Education		
Literate	7	4.8
Primary School	**108**	**73.5**
High School	28	19.0
University	4	2.7
Hospitalization		
Yes	61	41.5
No	**86**	**58.5**
Nurse Acquaintances		
Yes	32	21.8
No	**115**	**78.2**
If yes, who? (N=32)		
Relative	**25**	**78.1**
Neighbor	7	21.9

When the socio-demographic characteristics of the children shown in Table 3 are compared with the image of the nurse that they depicted in their drawings, it was seen that there was a pronounced statistical difference between groups ($p<0.05$). Advanced statistical analysis with the chi-square showed that the difference stemmed from the 13 year-old group. It was established that the older the children were, the more negative were their images of nurses (e.g., Figure 2). There were statistical differences in groups in terms of the image of the nurse in the pictures and whether or not the child was acquainted with any nurses ($p<0,05$); it was discovered that all of the children who did have nurse acquaintances drew a positive image of

Table 2. Characteristics of the Children's Drawings (N=147)

Characteristics	Number (n)	Percentage (%)
The Role of the Nurse as Depicted in the Drawings		
Treatment-providing	**104**	**70.7**
Protective	20	13.6
Consultant	8	**5.5**
Care-giver	6	4.1
Other (e.g., quiet environment, hospital rules, uniforms)	9	6.1
Nurse Appearing in the Drawing		
Yes	**101**	**68.7**
No	46	31.3
If No, what does appear? (N=46)		
Hospital	19	**41.3**
Hospital Equipment and Supplies	**27**	**58.7**
Thoughts about Nurses (N=101)		
Positive	**84**	**83.2**
Negative	17	**16.8**
Gender of the nurses in the drawings (N=101)		
Female	**85**	**84.2**
Male	16	**15.8**

*Table 3. Comparison of Some of the Children's Socio-demographic Characteristics with the Image of the Nurse in their Drawings (N=101)**

Children's Characteristics	Image of the Nurse				p
	Positive		Negative		
	Number (n)	Percentage (%)	Number (n)	Percentage (%)	
Age					
11	36	30,8	1	6.2	
12	33	32,4	6	6.6	**.000**
13	15	20,8	10	4.2	
Hospitalization					
Yes	33	76,7	10	23.3	
No	51	87,9	7	12.1	.112
Gender					
Girls	50	90,9	5	9.1	**.022**
Boys	34	73,9	12	26.1	
Nurse Acquaintances					
Yes	26	100.0	-	-	**.004**
No	58	77,3	17	22.7	

** Only the drawings containing the figure of a nurse were evaluated.*

a nurse. On the other hand, it was also found that girls were more likely to depict a positive image of a nurse compared to boys ($p<0.05$)

When a comparison was made of the child's own gender and the gender of the figure of the nurse in the drawing, it was seen that the gender of the nurse in the picture was the same as their own (e.g., Figure 3); this was found to be a statistically strong association ($p<0.05$) (Table 4).

Discussion

Nursing, which occupies an important place in the health system, is a discipline which looks at the whole person in all dimensions, whether the individual is healthy or unwell (Kaya, Turan, Öztürk 2011). The current status of a profession is closely associated with the image of that group within society and this image is of great importance to the members of that profession. Perceptions about individuals of a parti-

Figure 2. Example of a drawing with a negative image of a nurse (Girl, 13 years)

Figure 3. A figure of a nurse that matches the gender of the child (Girl, 12 years)

cular occupation start from experiences with actually seeing and being acquainted with persons of the profession and eventually cause individuals to reach a conclusion based on these experiences. (Çınar and Demir 2009). In particular, determining what perceptions and thoughts children, the adults of the future, have about health professionals is extremely important in terms of shaping and defining health services.

The drawings in the study were examined in terms of which role the nurse figure in the picture was assuming. Nurses were mostly perceived to be involved in treatment, with the protective role, the consultant's role, and lastly, the care-providing role following respectively (Table 2).

In a study conducted by McDonald and Rushforth (2006) on how the roles of doctors and nurses are perceived, a different finding was reported. Children attributed therapeutic services to doctors and perceived nurses to be responsible for care-giving. It has been set forth that traditionally, nursing has been perceived to be a profession of individuals who help doctors and implement treatment planned by the doctor (Ay Akça F 2008; Koç and Sağlam 2009). Similarly in the present study, it was seen that the drawings of the students were more likely to depict nurses as providing therapeutic services. The contemporary concept of the nurse as a care-provider was less frequently encountered in the drawings. The high percentage of almost half of the children (41.5%) in the study depicting the nurse in the role of treatment-provider might be the outcome of the children's having an experience with hospitalization and the depiction of the nurse in a protective role may have its origin in the children's familiarity with nurses during school vaccination campaigns. It can however be said that the care-providing aspect of a nurse's duties and responsibilities is not as much known. While most of the children (57.1%) depicted the nurse in a positive manner (smiling, for example), it was seen that 57.8% drew the nurse as

*Table 4. Comparison of the Consistency of the Gender of the Nurse in the Drawing with the Child's Own Gender (N=101)**

Gender of Nurse in Drawing	Child's Gender				p
	Girls		Boys		
	Number (n)	Percentage (%)	Number (n)	Percentage(%)	
Girls	54	46,3	31	38.7	**.000**
Boys	1	8,7	15	7.3	

** Only the drawings containing the figure of a nurse were evaluated.*

a female figure and 10.9% as a male (Table 2). As the profession of nursing is more likely to be perceived as an occupation for women, the children's drawings of nurses as women figures was an expected outcome. Studies show, on the other hand (Kaya,Turan,Öztürk 2011; Koç and Sağlam 2009), that nursing is fast becoming a mixed-gender professional group and the profession of nursing, once perceived as exclusively for women, is experiencing a steady influx of males. To see children adding male figures to their depiction of nurses is a quite positive reflection of this development in nursing.

When certain socio-demographic characteristics were compared with the image of nurses in the drawings, it was found that the older the children were, the more they were likely to portray nurses in a negative light; also, girls were more likely to be more positive about nurses than boys, and children who had nurse acquaintances were more likely to draw positive pictures of nurses. All of these findings were statistically significant (Table 3).

These results are thought to have come about because older children might have had more experience with hospitals and nurses, girls were likely to feel more of an affinity toward nursing, a profession that their age group could identify with, and finally, in the last case, children who were acquainted with a nurse could make closer observations about that person outside of the hospital environment.

To conclude, the findings of the study were the following: most of the children in the study drew nurses in the therapeutic context; there were figures of nurses in the drawings; more than half of the children who drew figures of nurses portrayed them in a positive light; the older children were, the image they drew of the nurse became more negative; and finally, the gender of the nurse in the drawings was mostly consistent with their own. It is our recommendation that this subject be planned and explored in a larger sample and with different variables (e.g., the effect of the image of the nurse reflected in the mass media), supported with qualitative studies that include focus-group discussions and in-depth interviews.

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Good Pediatric Nurse' Characteristics In According To Student Nurses

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Abstract

This study has been done to identify nursing students' opinions about how should be the characteristics of nurses who working in the relevant sections with the children. The study was conducted with the nursing students who successfully complete the child health and illness nursing education in the third-year. This study was carried out with the third grade years. The conditions sought as the criteria for inclusion in the study to take lesson of Child Health and Nursing and having success and willing to participate in the study. The data was collected by questionnaire which distributed to students after necessary explanation. The open-ended question was asked to the students: 'What is your opinion about how should be the characteristics of a good Pediatric Nurse?. The obtained data was classified and evaluated as a percentage by researchers.

It was determined that 83.6% of the students who participating in the study were girls (n = 46), 16.4% male (n=9) and the average age is as 21.85. The student nurses propose that good children nurse should have; patience and consideration % 72.7 (n=40), caress of children %50.9 (n=28), geniality %43.6 (n=24), adequate theoretically knowledge on pediatric nursing % 41.8 (n=23), communicate well % 41.8 (n=23), empathy %30.9 (n=17), practice %27.2 (n=15), careful %25.4 (n=14), able to give discharge training %18.2 (n=10), social %14.5 (n=8) right medicine principles, keeping innovations, education, successfully, balance work and private life, courageous, follower, honest, importance at team work, humaneness, persuade, love in nursing, harmonic, regard of hygiene, norm behaviors.

As a result, it was seen that most of students are expressed their properties, to be patient and love the children. Very few students reported love the job, team work and role of educators are not seriously.

Key words: Good Pediatric nurses' characteristics, good characteristics, student nurses

Introduction

Good nurses are regaining attention as a way to establish a comprehensive nursing ethical model, which will appropriately reflect actual nursing (1). Ethical nursing is what happens when a good nurse does the right thing (2). Good nurses are shown to be characterized by specific, but inter-related, attitudes, skills and knowledge; they engage in person-to-person relationships, respect the uniqueness of patients, and provide support (3). Children's nursing has much in common with other branches of the profession but there are also differences. Children's nurses have knowledge of the psychosocial and biological development of children and in common with all nurses; they are a communication conduit owing to their contact with members of the multidisciplinary team (4). Children and families are an integral part of that team, facilitated by the children's nurse, who works in partnership with them to provide care (5).

Pediatric nurses play an important role in making children better. A good Children nurse have to be able some characteristics. A nurse with a quick smile, endless patience, and a friendly personality can make the experience of staying in a hospital a lot less scary for kids. Pediatric nurses must also be able to easily relate to worried parents and other family members. Professional and trained skills as well as broad and specific nursing and non-nursing knowledge are important (5).

Children's method of communicating with others is different from adults, so nurses caring for children need to understand that method in order to effectively communicate with young clients and develop appropriate strategies (6). A good Children nurse have the ability to put a child at ease. Good Children nurses are obliged to provide quality nursing care that meets the good standards of their profession. To acquire and practice the skill of good pediatric nurse is essential for nurses in order for them to be able to influence a health care receive.

Research relating to nurses' views of the good nurse has mainly focused on the perspectives of nurses (7-10), with little exploring the perceptions good Children nurse of nursing student.

The purpose of this descriptive, qualitative study was therefore to examine student nurses' perceptions of what it means to be a good Children nurse. We hope that the opinions of students about the characteristics of a good Children nurse, and the presence or absence of these opinions among the reported fields of competency, may be included in discussions leading to changes and development within structured Children nurse education program.

Method

This descriptive and qualitative study was conducted to determine nursing students' observation of good Children nurse' characteristics expected in their clinical practice. We planned this study with nursing students at high school of health of Sakarya University to explore the perception that nursing students exhibit with good nurse in the finish (spring term 2010) their education. Three class student nurses were recruited during issues on at the good nurse characteristics in Children nursing lecture by lecturer. A convenience sample of 55 participant was achieved virtually all of the registrants at the lecture. Lecture attendees who chose to participate were asked to respond in writing to the following one open-ended questions : "A good Children nurse is one who……."

Data were collected through a questionnaire from 55 volunteer nursing students at a university-based nursing school in Sakarya, Turkey. Participant's consent was obtained to use their answers for the purpose of this study. Open –ended question were analysed using content analysis and techniques

Results

This article presents findings from a qualitative study that explored views of the good Children nurse from the perspective of student nurses. The aims of the study were to identify characteristics of the good Children nurse from the perspective of student nurses in University. 55 student nurses were interviewed using a write technique. We asked the participating student nurses which the most important 5 Characteristics for Good Children Nurses'. Characteristics relating to student's views of the good nurse emerged from the analysis: patience and consideration % 72.7 (n=40), caress of children %50.9 (n=28), geniality %43.6 (n=24), adequate theoretically Knowledge on pediatric nursing % 41.8 (n=23), communicate well % 41.8 (n=23), empathy %30.9 (n=17), practice %27.2 (n=15), careful %25.4 (n=14), able to give discharge training %18.2 (n=10), social %14.5 (n=8) right medicine principles, keeping innovations, education, education, successfully, balance work and private life, courageous, follower, honest, importance at team work, humaneness, persuade, love in nursing, harmonic, regard of hygiene, norm behaviors. (Table 1). Each of these will be discussed in relation to good nurse literature and recommendations made for student nurses' nursing practice.

Table 1. Good Pediatric Nurses' Characteristics (N=55)

Good Pediatric nurse should have	n	%
1. patience and consideration,	40	72.7
2. caress of children,	28	50.9
3. geniality,	24	43.6
4. adequate theoretically knowledge on pediatric nursing,	23	41.8
5. communicate well,	23	41.8
6. empathy,	17	30.9
7. practice,	15	27.2
8. careful,	14	25.4
9. given discharge training,	10	18.2
10. social,	8	14.5
11. right medicine principles,	6	10.9
12. keeping innovations,	6	10.9
13. regard of hygiene,	6	10.9
14. love in nursing,	6	10.9
15. courageous,	6	10.9
16. follower,	6	10.9
17. honest,	6	10.9
18. humaneness,	6	10.9
19. harmonic,	5	9.1
20. importance at team work,	5	9.1
21. persuade,	4	7.3
22. education,	3	5.5
23. balance work and private life,	2	3.6
24. norm behaviour,	1	1.8

Discussion

Children nurses play a key role in meeting children's nursing needs, taking into account their medical, social, cultural and family circumstances. Good nurses do make a difference in the care of children patients. In addition to the basic characteristics that are beneficial to all nurses, pediatric nurses often possess additional skills and characteristics that help them with working with this specific age group.

This study sought to gain an insight into perceptions of a 'good nurse' among Children nurses, and to identify its central components. By understanding these factors, it was hoped that common difficulties could be identified, enabling recommendations to be made to enhance patient care and reduce the pressures to which nurses are exposed.

In the study of Brady (5) presents findings from a qualitative study that explored views of the good nurse from the perspective of hospitalized children. Five themes relating to children's views of the good nurse emerged from the analysis: communication; professional competence; safety; professional appearance; and virtues. According to Brady (5) five themes relating to children's views of the good nurse emerged from the analysis: communication; professional competence; safety; professional appearance; and virtues.

In Brady's study (5) it was reported that being smiling and speak with a soft tone, being clean and tidy such as features emphasizes mostly by children at the beginning of a good nurse characteristics. In our study as well, the student nurses' opinion among well pediatric nurse characteristics, the first row is being smiling, to be patient and communicate well. This suggested to us that our students being a good observer and able to make empathy during children's course of clinical practice. To focus on these features and learn the techniques of good communication with children is extremely important during the training of students. When they graduated and preferred to work in pediatric clinics, these properties will be the sought properties on themselves. At the same time they will be more successful and satisfied in the working environment.

In the study Schmidt et al (11) seven themes emerged from the children's responses. Children appreciated nurses who smiled and used kind words (positive attitude/affect), took measures to reduce pain (physical comfort), provided age-appropriate diversion and light-hearted conversation (entertainment/humor), promoted positive well-being and a sense of security (advocacy), provided food and medicine (basic needs), interacted with them as an individual (acknowledgment), and provided comfort and support (reassurance). Differences were noted by age, chronicity, parental presence, prior admission, and days in the hospital (11).

According to the results of the current study, patience and consideration as the first ranking in the characteristic of good nurses (Table 1). It is likely that, although patience and consideration should be a desired characteristic in minds of the professionals, especially for the practical and registered nurses, there appears to be a considerable disagreement in the nurses' profession understanding.

Nonetheless, for their selves, the characteristic of caress of children, geniality adequate theoretically knowledge on pediatric nursing, communicate well, empathy, practice, careful, able to give discharge training, social, right medicine principles, keeping innovations, education, education, successfully, balance work and private life, courageous, follower, honest, importance at team work, humaneness, persuade, love in nursing, harmonic, regard of hygiene, norm behaviors seems to have less importance (Table 1).

Randall et al. (12) had reported the children were able to identify three areas of learning that could help to make a good children's nurse. The researchers categorised these as: attitudinal and professional persona; Cognitive and psychomotor learning; experiential learning (12). A pediatric nurse has a true understanding of the special needs of children. Their bodies are growing and they often have particular needs in relation to injuries, illness, and medications. Pediatric nurses have to be able to communicate well with both children and adults to determine the best course of action in many situations. Children's nurses are special people with some innate characteristics; they also needed education to make them good at nursing children. A good pediatric nurse have the ability to put a child at ease and, often just as important, separate the child from the parent so that the patient’s fears aren’t fed by the parent’s histrionics.

Given that nurse-patient interaction is essential factor in nursing care, the ability to interact with patient is the one of the important characteristics as a professional nurse.

The data suggest that nursing student good nurse perceptions is often influenced by seeing nurses in practice. Therefore role models must be determined that the good nurse' characteristic and served as good nurse (13). The characteristics that define good nurses lead to effective nursing care and increase the well-being of padeatric patients.

Nurses caring for children should acknowledge them (with conversation or smiles) with each interaction, provide age-appropriate diversion and friendly interaction, provide basic needs in a gentle manner, and engage in protective and advocacy behaviors, such as frequent stops to assure a child's safety and well-being. Children appreciate a smile, a gentle touch, and kind words. Nurses who care for children should realize their continued need for physical comfort, reassurance, and conversation and know that these children understand and appreciate the advocacy roles nurses assume.

Conclusion

Pediatric nursing is very different from any other types of nursing. As a result, it was seen that most of students are expressed their properties, to be patient and love the children. Very few students reported love the job, team work and role of educators are not seriously. Nurse education plays a crucial role in the development of good nursing practices. Nursing ethics education in particular aims to encourage virtuous attitudes, forming the foundation from which to provide good care. Being a good nurse requires an effective learning process. Therefore nursing educators is must be prepared student nurses for good nurse characteristic. Also the good nurse perceptions of student in the teaching of nursing will contribute to this process (13).

The result of this study would help us as educators to design strategies for more effective clinical teaching. The results of this study should be considered by nursing education and nursing practice professionals. Faculties of nursing need to be concerned about good Pediatric nurse characteristics in education and clinical practice. The findings support the need for Faculty of Nursing to plan nursing curriculum in a way that nursing students be involved actively in their education.

If students can be educated in ways that sustain and enhance their good Children nurse characteristics, and in particular foster the concept they already possess (at the beginning of their three year) of an 'good Children nurse' who will meet the expectations of the patients they are preparing to serve professionally, this will contribute significantly to their development as good Children nurse. Equally, it is important that the curriculum include opportunities to identify and acquire any appropriate characteristics in which they are lacking. The authors believe that it would be useful to carry out further research studies on the way in which students change their characteristics, and their good Children nurse, during training. They would also welcome more research on how different clinical situations can impact on students' characteristics, as this could have an important impact on developing the good Children nurse characteristics of the lesson of Child Health and Nursing curriculum.

Our research results cannot be applied to all the children nurses in the country. More wide-ranging research would be necessary before generalizations are made. This study sought to gain an insight into perceptions of a ' good Children nurse' among student nurses, and to identify its central components. Our findings suggest that many of the characteristics identified by these three-year nursing students as 'characteristics of a good Pediatric Nurses'' are in line with the competency fields of the projects that combine clinical knowledge and skills with humanitarian values.

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First records of Ornithodoros sp. soft ticks from an endemic relapsing fever region in Northern Iran

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Abstract

Tick borne relapsing fever (TBRF) is endemic in six north-western and central provinces of Iran, including Mazandaran, from where the disease has been reported for many years. In surveys carried out in 2008 and 2009, we recorded the presence of *Ornithodoros lahorensis* and of *O. tholozani* which is the main vector of TBRF in Iran. *O. tholozani* were found infesting the walls of animal housing adjacent to human homes while *O. lahorensis* were found on the bodies of domestic animals, particularly in the fleece on sheep, an apparent phoretic behaviour that might facilitate dispersal of these soft ticks. *O. tholozani* is reported here for the first time in Mazandaran an increasingly popular holiday destination for the population of Tehran and Iran.

Key words: TBRF, relapsing fever, *Ornithodoros, tholozani, Borrelia*, *persica*, tick, Argasid, vector, Iran

Introduction

Tick-borne relapsing fever (TBRF) is a potentially fatal human infection caused by *Borrelia* spirochaetes and transmitted by soft ticks (Argasidae), usually of the genus *Ornithodoros*. It is found worldwide with the exceptions of Australasia and the Pacific region (Assous & Wilamowski, 2009; Jongejan & Uilenberg, 2004; Service, 2008; Warrell & Parry, 2004). Typically it is a zoonotic disease with rodents as reservoir hosts, although in Africa, insectivores and some domestic animals also are infected (McCall et al., 2007; Vial et al., 2006).

In Iran, Joseph Désiré Tholozan first described the disease in 1879. As he also recognised the association with ticks, the vector species *Ornithodoros tholozani* Laboulbène & Mégnin, 1882 was named after him (Rodhain, 1998; Théodoridès, 1998). TBRF still occurs today in 18 of the 30 Iranian provinces, and it is considered endemic in five provinces of the north west, Ardabil, Hamadan, Zanjan, Kordestan and Qazvin, where 90% of all TBRF cases in Iran occur (Arshi et al., 2002; Nabian & Rahbari, 2008; Rahbari, Nabian, & Shayan, 2007). A total of 500 cases were reported in 2002, falling to 50 in 2006, a reduction that may be attributable to improvements in housing, access to healthcare, case detection and treatment and possibly reduction in domestic tick populations arising from the increased use of insecticides in the home against a range of vectors and nuisance insects (Aghighi et al., 2007).

Most TBRF cases occur in rural areas, particularly in communities where maintenance of livestock is the primary occupation. Cases occur in every month but reach highest levels during the drier season from June to November (Arshi et al., 2002; Masoumi Asl et al., 2009). The disease is more common in children and in migrants from non-endemic areas, suggesting that ongoing transmission in endemic areas sustains some degree of immunity in local human populations (Arshi et al., 2002; Masoumi Asl et al., 2009). Although four *Borrelia* species, *B. persica*, *B. microti*, *B. latyschewii* and *B. baltazardi*, have been recorded in Iran, *B. persica* has been identified in the majority of clinical ca-

ses (Aghighi et al., 2007; Masoumi Asl et al., 2009; Pouladfar, Alborzi, & Pourabbas, 2008; Rafinejad et al., 2011; Vatandoost et al., 2003), with *B. baltazardi* found in only a few cases (Arshi et al., 2002).

Four *Ornithodoros* species (*Ornithodoros tholozani* Laboulbène & Mégnin, 1882; *Ornithodoros lahorensis* Neumann 1908; *Ornithodoros canestrinii* Birula 1895 and *Ornithodoros erraticus* Lucas, 1849) have been recorded in Iran within the past ten years. *O. lahorensis*is the most widespread species and often the most abundant, while *O. canestrinii* was the only species found recently in the eight northwestern provinces (Nabian & Rahbari, 2008). *O. tholozani* is less common but probably the most important vector of TBRF; the other more common tick species may not be vectors. For example, *O. lahorensis*, *O. canestrinii* and *O. tholozani* were collected in animal and human shelters in Hamadan province, but only *O. tholozani* (3.7%) were infected with *Borrelia* (identified as *B. persica* by (Vatandoost et al., 2003). In other locations, even when all four tick species were found, only *O. tholozani* was infected with *B. persica* (Aghighi et al., 2007; Arshi et al., 2002; Masoumi Asl et al., 2009; Nekoui, Assmar, Amirkhani, & Pyazak, 1999; Telmadarraiy, Bahrami, & Vatandoost, 2004). The only other infections found were *B. microti* in *O. erraticus*, which was found mainly in rodent burrows (Aghighi et al., 2007; Arshi et al., 2002; Masoumi Asl et al., 2009; Telmadarraiy et al., 2004). Hence, *O. tholozani* is considered the primary vector and *B. persica* the main causative agent of human TBRF in Iran.

The northern Province of Mazandaran is of particular interest given that cases of TBRF have been reported here in recent years (Masoumi Asl et al., 2009). In terms of geography, rural practices and climate, it is similar to Ardabil province where the highest TBRF figures are recorded (Masoumi Asl et al., 2009), yet recent vector surveys either found no *Ornithodoros* ticks (Nabian, Rahbari, Shayan, & Haddadzadeh, 2007) or only *O. lahorensis (Shayeghi, Khoram Rooz, & Piazak 2004)*. Mazandaran is of particular interest as it has become increasingly popular as a holiday destination for the population of Iran, and particularly Tehran as it is relatively close to Tehran. We undertook a survey of selected parts of the province and report here on the first records of potential TBRF vectors from this area.

Materials and Methods

The survey was undertaken in Sari Township, the capital of Mazandaran province (36° 34' 4" North, 53° 3' 31" East, map 1). Mazandaran province has two distinct geographical areas: a mountainous area where livestock (sheep, goats and cows) are common and a lower plain/littoral area where cultivation of rice and wheat predominates. At least one village was visited and sampled in both highland and plain areas in Sari Township in every month during 2008 and 2009. Daily records of temperature, relative humidity and rainfall were obtained from the meteorology departments of Mazandaran province and Sari town.

The walls of animal and human dwellings were closely examined and every crack, hole and crevice was widened or explored well beneath the surface, breaking apart lumps of material if necessary, as few ticks were ever seen in the superficial layers. Ticks were gently extracted with forceps and transferred to labelled plastic tubes containing corrugated filter paper for transport to an insectary (28±2°C temperature, 70±5% relative humidity and 12:12 dark: light photoperiod).

Individual animals were also examined for the presence of soft ticks. Attention was paid to all areas of the body, especially areas with thick wool.

Ticks were identified to species level using identification keys (Walker et al., 2003).

Results and Discussion

A total of 52 villages were sampled over the two-year study period, 14 in the plain and 38 in the higher mountainous region. No soft ticks were collected in any of the villages in the plain region at any time of year. In the mountainous areas, ticks were found in only 2 villages. All the ticks were identified as either *Ornithodoros tholozani* Laboulbène & Mégnin, 1882 or *Ornithodoros lahorensis* Neumann 1908.

O. tholozani was collected in large numbers from the cracks and crevices of animal shelters in adobe houses in the village of Vary (36°15'52" N, 53°30'24" E; altitude 1225m) 75 km south of Sari, in April and December 2008. All samples of *O. tholozani* were collected from deep cracks and crevices in the walls of the mud-walled and that-

ched animal shelters, a typical habitat for many *Ornithodoros* species. These animal shelters adjoin human habitations and animals were often kept in the same rooms as sleeping humans at night. No ticks were found in newer brick and cement housing in the same villages.

O. lahorensis was collected from animals (mainly sheep) and housing in the village of Bard (36°13'01" N, 53°47'58" E; altitude 2250m) some 40 km from Vary, in September 2008. All stages and both sexes of *O. lahorensis* were more frequently found on the animals than in cracks and crevices of the walls even when not blood feeding. Here, animals were kept on a separate floor below the human-occupied level in the same mud-walled and thatched dwelling.

The human population of this region is predominantly rural and living standards and socio-economic levels are well below average for the region and Iran generally. Domestic animals are housed in close proximity to human dwellings or sometimes together with humans in the same house. The traditional house building materials give rise over time to the numerous cracks and crevices that provide a highly suitable environment for argasid ticks.

The study area comprised of two main regions of plain/littoral and mountainous areas. The mean annual rainfall in the Sari Township was 700 mm, however, much of the rainfall occurred in the plain/littoral region. The mountainous areas were comparatively dry and cold in winter. The climatological factors of the study area are summarized in Table 1. There are major differences in mean humidity and temperature between the two regions of the study area, which may explain the differences in the fauna and the abundance of the soft ticks collected. No soft ticks were collected from the plain/littoral region of the study area.

The mountainous regions of the study area are mostly rural with low living standards. Domesticated animals are kept in close proximity to human dwellings in the residential complex of each family. The houses and animal shelters are mainly made out of thick row mud brick walls often with many cracks and crevices which make the perfect hideouts and breeding places for the argasid ticks.

Although different *Ornithodoros* ticks have been found in northwest Iran, this is the first report of two species of soft ticks in the mountainous re-

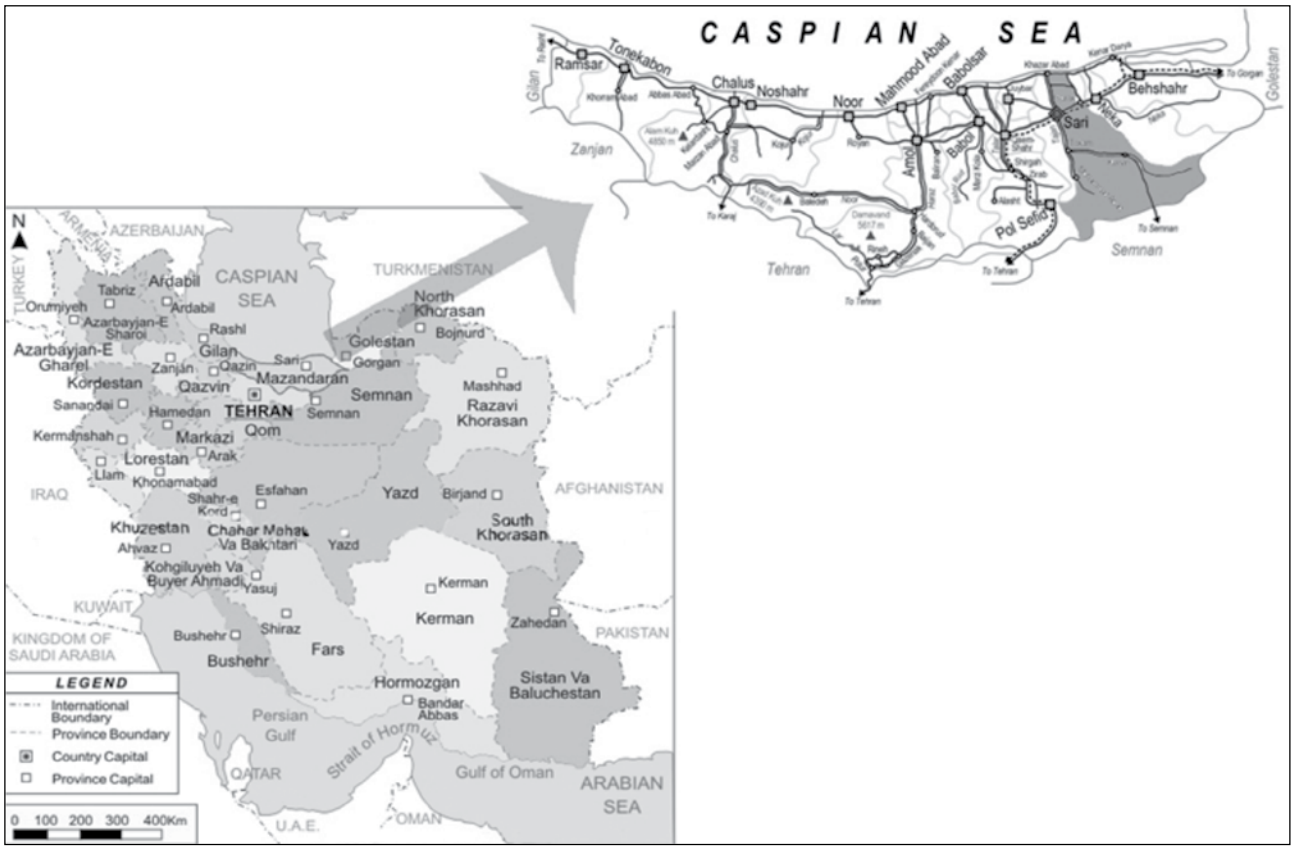

Figure 1. Map of Iran and Mazandaran Province which is situated in the North of Iran and Alborz mountain range, and South of the Caspian Sea. Sari (in gray) is the capital city of the province.

Table 1. Climatologic factors of the two study areas in Sari Township, North of Iran. Sari represents the plain/littoral area and Kiasar represents the mountainous area.

Area/Month	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	M	AM
Sari														
Mean T	17.6	20	23.6	26.1	28.7	28	21.2	14.6	11.4	7.4	10	13	18.4	7.4
AM min T	8.4	9.4	15.8	18.8	21.2	19	14.4	4.4	-1	-1.8	0	6	9.6	-1.8
M min RH	49	54	54	57	52	51	60	60	60	59	60	48	55	48
Kiasar														
Mean T	9.1	13.6	20.2	18.9	24.6	21.7	15.3	12.9	5.9	-3.4	0	9.5	12.4	-3.4
AM min T	-1.4	2.4	10	12.4	14.6	12.4	6	3	-8	-12.8	-9.6	-5.8	1.9	-12.8
M min RH	52	58	48	70	45	42	47	36	51	54	54	29	44	29

Table 2. Frequency and collection point of the soft tick species in Sari Township, North of Iran.

Location/species	O. tholozani	O. lahorensis	Altitude (m), climate
Vary	56*	-	1200, cold and dry
Bard	-	68*	2200, colder and drier
Collection point	Cracks and crevices of the animal shelters	Cracks and crevices of the animal shelters but mostly animals (mainly sheep) body	-

**more ticks could be collected from the same dwellings within the village, but not from other villages in the area.*

gion with totally different climatological characteristics (Table 2).

A seasonality in abundance of soft ticks was observed in northwestern parts of the country, where the soft ticks were abundant during November to March (Nabian & Rahbari, 2008; Rahbari et al., 2007). In contrast, the abundance of *O. lahorensis* in Mazandaran province was much lower in winter than in other seasons (Shayeghi, piazak, Yazdi, & Abolhasani, 2004). However, in our study no clear pattern of seasonality was observed. This might be attributable to climate differences between the northern and northwestern parts of the country. The average minimum temperature recorded in the northern parts of the country where our study areas are situated, was rarely below -2 ºC, while the temperature in the northwestern parts of the country is lower than – 10ºC in most winter months .

During winter the *O. lahorensis* ticks may prefer the warmth of their animal host rather than occupy the cracks and crevices of the walls of the animal or human shelters, where they spend the warmer summer months. During the winter it was possible to collect non-blood feeding and molting ticks and their shed exoskeletons from the fleece of their hosts.

Earlier studies, where seasonal abundance shifts were reported concentrated on examining the animal hosts (Nabian & Rahbari, 2008; Rahbari et al., 2007), and may have under estimate the numbers living in animal and human dwellings. Telmadarraiy et al (2004) reported no seasonality in the abundance of soft ticks, predominantly *O. lahorensis* collected from West Azarbaijan Province in Iran, after searching both cracks and crevices of the walls and animal hosts (Telmadarraiy et al., 2004).

A clear difference was observed between the ecological niches of *O. lahorensis* and *O. tholozani.* Although both species prefer the mountainous areas over the lowlands, *O. lahorensis* was more abundant in dryer and semi-arid environments compared with *O. tholozani*. The latter species was found in lower altitude mountainous areas with higher relative humidity and less extreme temperature fluctuations.

O. tholozani, did not show any seasonality in abundance and were rarely collected from animals, but more commonly found from the cracks and crevices of the walls of the animal and human shelters throughout the year.

It is also important to distinguish between seasonal activity and seasonal abundance. What is reported as seasonality might just be the seasonal activity of the ticks rather than the seasonal abundance.

Confirmed cases of TBRF have been recorded from Mazandaran in recent years (Masoumi Asl et al., 2009), but this is the first record of the main Iranian TBRF vector *O. tholozani* in the province. Future work will determine if they harbour *Borre-*

lia sp. infections. The presence of *O. tholozani* in animal shelters raises the question of whether domestic animals might also be infected with *Borrelia sp.*, possibly even acting as reservoir hosts for human TBRF, as has been suggested in East Africa (McCall et al., 2007).

The proximity of both tick species to domestic animals was not surprising, although the presence of multiple stages and exuviae of *O. lahorensis* within the wool of its sheep hosts, was an interesting observation. This suggests a level of adaptation where these soft ticks apparently remain on the host between blood meals to moult. If confirmed, it seems plausible that this behaviour should be a response to the cold and dry climate: mean daily temperatures here range from -3.4 to 24.6°C and relative humidity does not exceed 60% (data from the Meteorology department, Mazandaran province). It is not known whether other activities such as mating might also occur on the host.

The propensity of *O. lahorensis* (and also possibly other species) to infest hosts, rather than buildings, could be a seasonal phenomenon, and ticks might return to the house during the warmer summer months. If so, it could give rise to false negatives when prospecting for domestic soft tick infestations if both locations were not investigated. Telmadarraiy *et al.* (2004) reported no seasonality in the abundance of soft ticks, predominantly *O. lahorensis*, after searching both cracks and crevices of the walls and animal hosts, whereas seasonal abundance shifts were reported when animal hosts alone were investigated (Nabian & Rahbari, 2008; Rahbari et al., 2007). This behaviour also could result in a phoretic outcome for the ticks, permitting them to 'migrate' and colonise new housing elsewhere, a phenomenon never before considered for *Ornithodoros sp.* or the *Borrelia spp.* that they might carry. Notably, the more important vector species *O. tholozani*were rarely collected from animals.

It is of interest that a proportion of the houses in these study sites are only temporarily inhabited, as the house owners live in the towns and only return to their rural house during the summer months. Locally, *Ornithodoros sp.* are called "Qaribgaz", meaning something that bites foreigners or newcomers, and TBRF is named "Tabe Qaribgaz" meaning a fever of foreigners and newcomers, suggesting that locals were less troubled by the ticks and had some level of protective immunity to *Borrelia*, as has been reported for endemic TBRF elsewhere (Dupont, La Scola, Williams, & Raoult, 1997; Pampana, 1928). This seasonal movement might result in humans, domestic animals and ticks functioning as vehicles for the dissemination of *Borrelia sp.* infections in Iran.

Clearly these aspects of TBRF epidemiology in the north and north west regions of Iran merit further investigation. However, given the public health importance of TBRF, more immediate steps can be considered to reduce the risk of infection. Domestic soft tick infestations can be eliminated by residual spraying of insecticides (Talbert, Nyange, & Molteni, 1998; Telmadarraiy et al., 2007)and other methods for control of domestic infestation of haematophagous Hemiptera, Siphonaptera and Diptera are also likely to be effective. Soft tick infestations and TBRF are typically associated with low-grade housing and when humans and animals sleep in close proximity, behavior most commonly associated with poverty worldwide. Thus, improved socio-economic levels, in addition to the multiple other benefits they bring, are likely to result in the gradual reduction and eventual disappearance of *Ornithodoros* from the house, ultimately leading to the elimination of this disease.

Acknowledgements

This project was funded by a grant from the Research Deputy of the Mazandaran University of Medical Sciences, Sari, Iran. We also would like to extend our gratitude to the technicians at the Mazandaran Provincial Veterinary Office.

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Cisplatin-induced nephrotoxicity in different regimens of cancer chemotherapy

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Abstract

Background: The use of cisplatin alone and in combination with other anticancer agents is associated with nephrotoxicity in all age patients.

Objectives: To investigate the nephrotoxic effects of high and low doses of cisplatin when used in combinations with other anticancer drugs and to evaluate the relationship of nephrotoxicity and age.

Methodology: Patients were selected randomly and prospective study was carried out on patients admitted in Department of Oncology, Mayo Hospital, Lahore, Pakistan. Sixty confirmed patients of a certain type of cancer were included in the present study. Chemotherapeutic regimens were selected on the basis of presence of cisplatin. Nephrotoxicity was estimated by comparing serum creatinine level to that of the reference value, 0.6-1.2 mg/dL.

Results: Out of sixty patients, twenty one (35%) were found to be having mild nephrotoxicity, thirty two (53.33%) moderate nephrotoxicity, six (10%) severe nephrotoxicity and one (1.67%) very severe nephrotoxicity. Independent sample t-test was performed and p-value for comparison of group I and II (low and high dose groups, respectively) was 0.838, and group III and IV (younger and elder patient groups, respectively) was 0.027.

Conclusion: Cisplatin-induced nephrotoxicity is independent of protocol of administration, rather it depends upon the rate of administration and preventive measures can only reduce degree of severity. Elderly people are found to be more vulnerable to this side effect than the younger ones.

Key words: Cisplatin, nephrotoxicity, administration protocols, creatinine

Introduction

Malignant diseases encompass a wide range of common as well as rare illnesses. The former ones include lung, breast and colon cancer and the latter ones include acute leukemias.[1] Treatment may be given with curative or palliative intent, depending upon the evidence from continuing clinical trials. [1] Most human neoplasms are monoclonal in origin i.e. arise from genetic mutations within a single affected cell, however, upon subsequent divisions heterogeneity develops through the accumulation of further abnormalities.[1] The kinetics of cancer cell growth appears to be exponential, however, the doubling times of human tumors are enormously variable.

Malignant diseases are the major causes of death in the developed nations. One out of three people may be diagnosed with cancer during their life time. In year 2001, 270,000 new cases of cancer were reported in the UK.[2] Moreover, cancer is responsible for approximately one quarter of all deaths in the UK.[2]

Cisplatin (cis-diamminedichloroplatinum [II]) is the first member of platinum coordination complex class of anticancer drugs[3, 4]. It is soluble in water and exhibits sufficient stability for intravenous use[5]. It is a commonly used chemotherapeutic agent for the treatment of solid tumors including neuroblastoma, osteosarcoma, hepatic tumors, brain tumors, lung cancer and carcinoma of head and neck, testicular cancer, ovarian cancer, cervical cancer, cancer of endometrium, bladder cancer as well as oropharyngeal cancer.[6] The clinical use of this drug is associated with dose-limiting nephrotoxicity which primarily affects S3 segment of the renal proximal tubules, which occurs in one-third of the patients despite intensive prophylactic measures[7, 8]. Although the exact mechanism of action is unknown but this is thought to be similar

to that of the bi-functional alkylating agents, that is, possible cross-linking and interference with the functions of DNA and a small effect on RNA.[9]

Twenty percent patients receiving high dose of cisplatin exhibit severe renal dysfunction.[10] It is metabolized to toxic moiety intracellularly and its highest concentration is found in cytosol, mitochondria, nuclei and microsomes. The toxicity is more pronounced at doses greater than 50 mg per square meter of body surface area.[9] It is recommended that cisplatin be administered with vigorous parenteral infusion to increase hydration which maintains urine output and reduce nephrotoxicity and ototoxicity, although not prevent them.[9] Therefore, there is a dire need of monitoring of renal functions during cisplatin chemotherapy. Vigorous pretreatment intravenous hydration, followed by adequate hydration and urinary output monitoring for 24 h is recommended. Mannitol or furosemide may also be used to produce excessive diuresis, provided that salt and water depletion are avoided.[9]

Cisplatin is used alone or in combination which are termed as regimens or protocols. Cisplatin is also been administered as a continuous intravenous infusion over a period ranging from 24 h to 5 days, and such administration appears to reduce nausea and vomiting but not nephrotoxicity or ototoxicity.[9] Combination of antineoplastic drugs has produced beneficial effects because regimens/protocols have been devised by taking into consideration the cell cycle specificity (CCS) and cell cycle non-specificity (CCS, CCNS) by observing patient's response.[11] The selected protocols are given in Table 1.

Efficiency of renal function is estimated through different tests like glomerular filtration test, serum creatinine level and creatinine clearance. Both creatine and creatine-phosphate cyclize spontaneously at a slow but constant rate to form creatinine, which is then excreted in the urine. Any rise in blood creatinine is a sensitive indicator of kidney malfunction, because normally creatinine is rapidly removed from the blood through renal excretion. A typical adult male excretes about 15 mmol of creatinine per day. Normal reference laboratory value of serum creatinine level is 0.6-1.2mg/dL.[12, 13]

Subjects and method

This study was conducted in a tertiary care hospital, Mayo Hospital, Lahore, Pakistan, during June 2011 to October 2011 after approval of the Ethical Committee of the hospital. Total sixty patients, registered in the hospital during the study period, were included in this study. Among sixty, twenty eight were males (46.67%) and thirty two were females (53.33%). The inclusion criterion of patients was the protocol/regimen containing cisplatin and diagnosed neoplastic disorder. Renal functions of all the patients were assessed before starting the chemotherapy and it was found that five patients (8.33%) were already suffering from mild nephrotoxicity due to previous or past medication. Rest of the patients was not nephrotoxic because their renal function test was normal. The study was conducted prospectively and patient's histories including anthropometric measurements height and weight etc. were also compared with patient's respective files. Range of age of the patients included was 43 ± 18 years. Among males, ten had testicular cancer, three had esophageal cancer, two had head and neck cancer, eight had non-small cell lung cancer, and five had small cell lung cancer. Among females, eleven

Table 1. Selected protocols and dose of cisplatin

No.	Protocol/Regimen	Drugs of protocol	Dose of cisplatin mg/m^2)
1	CF	Cisplatin, 5-Florouracil	70-100
2	DC	Docetaxel, Cisplatin	100
3	CE/PE	Cisplatin, Etoposide	80
4	PIAF	Cisplatin, Interferon α 2b, Doxorubicin, 5-Florouracil	30
5	GC	Gemcitabin, Cisplatin	100
6	ESHAP	Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C), Cisplatin.	25
7	PEB	Cisplatin, Etoposide, Bleomycin	25

had ovarian cancer, four had esophageal cancer, seven had cervical cancer, three had head and neck cancer, three had non-small cell lung cancer, two had small cell lung cancer and two had trophoblastic tumor. The demographic details of the respondents are given in Table 2.

Table 2. Demographic details of respondents

Respondents, gender, age and laboratory report	
Number of patients (n)	60
Gender (M/F)	28/32
Age (in years)	43 ± 18
Serum creatinine (mg/dL)	0.9 (0.6-1.2)
Diseases	
Head and neck cancer	5 (8.33%)
Cervical cancer	7 (11.67%)
Testicular cancer	10 (16.67%)
Ovarian cancer	11 (18.33%)
Esophageal cancer	7 (11.67%)
NSCLC*	11 (18.33%)
SCLC**	7 (11.67%)
Trophoblastic cancer	2 (3.33%)

** Non-Small Cell Lung Cancer; ** Small Cell Lung Cancer*

For the study, regimens/protocols selected included CF, GC, PIAF, ESHAP, PEB, CE (PC) and Docetaxel+Cisplatin. Range of dose of cisplatin in the selected protocols was 25-100 mg/m^2, given over time of five courses, whereas, the dose per course ranged from 125-500 mg/m^2/course. Average dose of all the protocols over five courses was 342.86 mg/m^2/course. Rate of administration of cisplatin in every patient was the same in every protocol. The factors which could affect, increase or decrease, the percentage of nephrotoxicity were controlled strictly during chemotherapy. Among such factors, hydration was the most important. Pre- and post-hydration was accomplished using either 0.9% NaCl solution or 5% dextrose solution or Ringer lactate solution. Cycles of chemotherapy were repeated after three weeks or 21 days. Course duration differed in regimens; the range was 3-5 days. Patients were divided into two groups depending upon the dose of cisplatin as group-I and group-II that were termed as low dose group and high dose group, respectively. Low dose group was receiving dose ≤ 30 mg/m^2 of cisplatin and high dose group was receiving dose ≥70 mg/m^2 (maximum 100 mg/m^2). Protocols included in low dose group were PEB, ESHAP and PIAF and high dose group included CF, GC, CE, Docetaxel+Cisplatin. Low dose group had twenty four (40%) patients and high dose group included thirty six patients (60%). Other chemotherapeutic agents included were 5-flourouracil, etoposide, gemcitabine, docetaxel, doxorubicin (adriamycin), interferon α 2b, cytarabine (ara-C), solumedrol (methylprednisolone) and bleomycin. Some of the patients were also receiving radiotherapy along with chemotherapy to improve response of neoplasm towards the therapy. These averages of all protocols were compared with one another by plotting bar graph. Then percentage contribution of every protocol in terms of increased creatinine levels in the given population of sixty patients was represented as pie chart. To compare low and high dose groups, independent sample t-test was performed as there was only one population receiving low and high doses of cisplatin. The data was processed using SPSS 12 software.

It was hypothesized that older patients might be more prone to nephrotoxicity and to test this hypothesis the population was also divided into two groups with respect to the age as patients with age ranging from 25-43 years (34±9 years) were termed as group III and patients ranging from forty four years to sixty one years (52.5 ± 8.5 years) were termed as group IV. Group III was composed of thirty three (55%) patients and group IV was of twenty seven (45%) patients. The detail of patients of both the groups is given in Table 3.

Table 3. Comparison of disease status of patients of group III and IV

Disease	Group III (34±9 Years)	Group IV (52.5±8.5 Years)
Cervical cancer	4 (6.67%)	3 (5%)
Testicular cancer	6 (10%)	4 (6.67%)
Head and neck cancer	1 (1.67%)	4 (6.67%)
SCLC*	1 (1.67%)	6 (10%)
Trophoblastic cancer	2 (3.33%)	0 (0.00%)
NSCLC**	5 (8.33%)	6 (10%)
Ovarian cancer	6 (10%)	5 (8.33%)
Esophageal cancer	2 (3.33%)	5 (8.33%)
Total	27 (45%)	33 (55%)

** Small Cell Lung Cancer ** Non-Small Cell Lung Cancer*

Nephrotoxicity grading

Nephrotoxicity grading was performed using a system in which serum creatinine levels were divided into five ranges on a 0 - 4 scale. The scale along with values and corresponding nephrotoxicity scores are given in the Table 4.

Table 4. Nephrotoxicity grading and score

Nephrotoxicity grades	Serum creatinine (mg/dL)	Remarks
0	≤1.2	No (WNL*) Nephrotoxicity
1	1.2-2.1	Mild Nephrotoxicity
2	2.2-3.0	Moderate Nephrotoxicity
3	3.1-3.9	Severe Nephrotoxicity
4	≥4.0	Very Severe Nephrotoxicity

**Within Normal Limits*

Results

Out of the population of sixty patients, only one patient (1.67%) developed severe nephrotoxicity (serum creatinine = 4.3mg/dL) and was on dialysis when required. Six patients (10%), three males (5%) and three females (5%), were suffering from severe nephrotoxicity. Thirty two patients (53.33%), eleven males (18.33%) and twenty one females (35%), had moderate nephrotoxicity. Twenty one patients (35%), fourteen. males (23.33%) and seven females (11.67%), were having mild nephrotoxicity. The results are presented in Table 5.

In Group I (low dose group), out of twenty four, seven (29.17%) were mild nephrotoxic, sixteen (66.67%) were moderately nephrotoxic. There was only one case (4.17%) of severe nephrotoxicity in this group. In Group II, high dose group, there were fourteen cases (38.89%) of mild nephrotoxicity, sixteen cases (44.44%) were of mild toxicity, five (13.89%) were severely nephrotoxic and one case (2.78%) was of very severe nephrotoxicity. Independent t-test showed p-value 0.838. The comparison of group I and II is given in Table 6.

Degree of nephrotoxicity was found to be directly related with the duration/number of course of chemotherapy as represented in Figure 1. All the protocols, by comparison, showed maximum average of nephrotoxicity score of 3 irrespective of the dose and number of chemotherapeutic drugs in protocols.

Table 5. Nephrotoxicity grades and scores (Total Population)

Nephrotoxicity grade	Number of cases	Percentage *	Nephrotoxicity score	Gender	Number	Percentage **
No(WNL***)	0	0	N/A	Male	0	0
				Female	0	0
Mild	21	35	1	Male	14	66.7
				Female	7	33.3
Moderate	32	53.33	2	Male	11	34.38
				Female	21	65.63
Severe	6	10	3	Male	3	50
				Female	3	50
Very Severe	1	1.67	4	Male	0	0
				Female	1	100
Total	60	100	…….	Male	28	46.67
				Female	32	53.33

**These percentages are taken out of total population of sixty patients*

***These percentages are taken out of the number of cases found in total population of sixty patients*

****Within Normal Limits*

Table 6. Comparison of high and low dose groups receiving cisplatin

Nephrotoxicity Score	Number of Cases in Groups						Remarks
	High Dose Group (CF+GC+CE/PE+DC)			Low Dose Group (ESHAP+PIAF+PEB)			
	Male	Female	Total	Male	Female	Total	
1	9	5	14	5	2	7	Mild
2	4	12	16	7	9	16	Moderate
3	3	2	5	0	1	1	Severe
4	0	1	1	0	0	0	Very Severe

CF (Cisplatin, 5-Florouracil); DC (Docetaxel, Cisplatin); CE/PE (Cisplatin, Etoposide); PIAF (Cisplatin, Interferon α 2b, Doxorubicin, 5-Florouracil); GC (Gemcitabin, Cisplatin); ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C), Cisplatin); PEB (Cisplatin, Etoposide, Bleomycin)

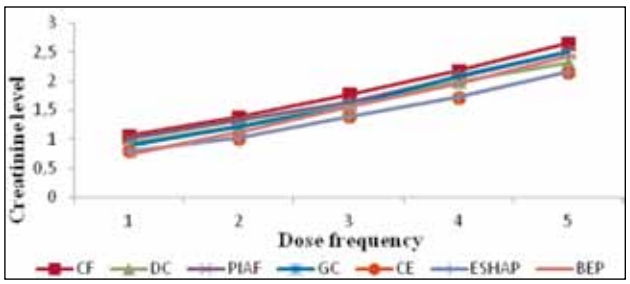

Figure 1. Comparison of creatinine level (mg/dL) of low dose and high dose groups receiving various regimens, Low dose group (CF (Cisplatin, 5-Florouracil); DC (Docetaxel, Cisplatin); CE/PE (Cisplatin, Etoposide); GC (Gemcitabin, Cisplatin); ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C), Cisplatin); High dose group: PIAF (Cisplatin, Interferon α 2b, Doxorubicin, 5-Florouracil; ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C) PEB (Cisplatin, Etoposide, Bleomycin)

In the selected population, when these protocols were compared with one another, CF protocol was found to be 15 % nephrotoxic as compared to other protocols. Similarly, in other protocols nephrotoxicity was as ESHAP (13%), CE (13%), DC (14%), PIAF (14%), GC (15%) and PEB (15%). The comparison of different protocols is given in Figure 2. The serum creatinine levels noted in different protocols are given in Figure 3.

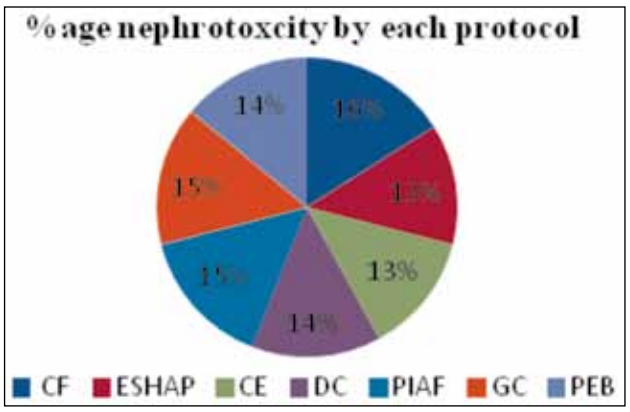

Figure 2. Pie chart of percentages of nephrotoxicity induced by cisplatin in different protocol in a given population, ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C), Cisplatin); PIAF (Cisplatin, Interferon α 2b, Doxorubicin, 5-Florouracil; ESHAP (Etoposide, Solumedrol (Methylprednisolone), Cytarabine (ara-C) PEB (Cisplatin, Etoposide, Bleomycin)

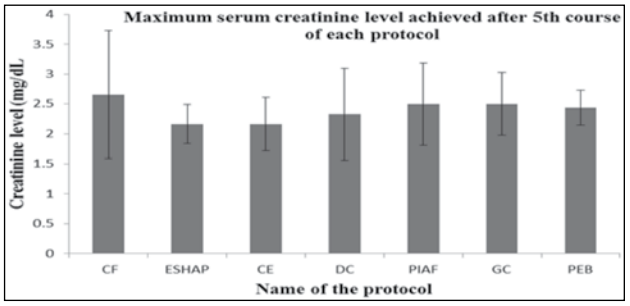

Figure 3. Comparison of maximum level of serum creatinine by all protocols, ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C), Cisplatin); High dose group: PIAF (Cisplatin, Interferon α 2b, Doxorubicin, 5-Florouracil; ESHAP (Etoposide, Solumedrol (Methylprednisolone), High dose Cytarabine (ara-C) PEB (Cisplatin, Etoposide, Bleomycin)

Table 7. Nephrotoxicity scores and number of patients in group A and B

Nephrotoxicity Score	Remarks	Group A 34±9 Years		Group B 52.5±8.5 Years	
		Number	Percentage*	Number	Percentage**
0	WNL**	0	0	0	0
1	Mild	10	37.04	11	33.33
2	Moderate	15	55.56	17	51.52
3	Severe	2	7.41	4	12.12
4	Very Severe	0	00	1	3.03

** Taken out total patients in group A, 27 **Taken out of total patients of group B, 33*
*** Within Normal Limits*

Division of population according to the age, in group III, ten (37.04%) were mildly nephrotoxic, fifteen (55.56%) were moderately, two (7.41%) were severely nephrotoxic. In group IV, cases with mild toxicity were eleven (33.33%), with moderate toxicity were seventeen (51.52%), with severe toxicity were four (12.12%), and one (3.03%) case with very severe nephrotoxicity There was no case of severe tetany reported and no complaints of severe paresthesia. P-value for this group comparison was 0.027 which is less than 0.05. The comparison of group III and group IV is given in Table 7.

Discussion

In this study, we found that degree of nephrotoxicity induced by cisplatin is independent of the protocols/regimens and the number of drugs included in protocol. Nephrotoxicity was also independent of the dose of cisplatin given as per square meter of body surface area, as per course or as total dose of five courses. The division of low and high dose groups of cisplatin was also representing close results with each other and neglecting the total dose given to a patient throughout the study. Some of the patients were also on other medication like antibiotics that can be nephrotoxic for them like aminoglycosides, vancomycin, amphotericin B, etc. Many findings of the study were unexpected and deviating from the expected conclusion. It was not clear why some patients receiving cisplatin developed severe glomerular impairment. Considerable inter individual differences in nephrotoxicity was apparent in this study, even between patients of similar age and receiving similar administration schedules and total dose of cisplatin. The diversity/diversion of results from expected may be the result of inter individual variability in cisplatin pharmacokinetics or may be at least partly responsible.[16] These unexpected results may also be due to other factors like hydration (including pre-, mid- and post hydration of chemotherapy and self-oral hydration), age, concurrent medication, rate of administration of cisplatin, etc.

Most of the patients receiving cisplatin treatment have stable renal functions.[20] Twenty five percent of patients have reversible azotemia for 1-2 weeks after treatment.[15] However, a significant minority of patients have a progressive decline in renal function.[10] Irreversible renal failure can occur with large doses and with multiple courses[15, 16]. Increased age, renal radiation and alcohol intake increase toxicity. Furthermore, 20% of all acute renal failure cases among hospitalized patients are attributed to cisplatin containing chemotherapy[7, 17]. In our study, most of the patients were suffering from mild to moderate nephrotoxicity and there were no case of acute renal failure reported. Severe and moderate nephrotoxic patients were still risk factors for chronic renal failure. Once nephrotoxicity occurs, the mortality rate is very high especially in patients who require hemodialysis for the treatment of acute renal failure.

Pre- and post-hydration is an important factor in reducing nephrotoxicity but still it is not used to eradicate this toxicity. Hyperhydration appears to reduce the frequency and severity of nephrotoxicity, rather than abolish it altogether. For the purpose of hydration, used parenteral hydration solutions were 0.9% NaCl infusion, 5% dextrose infusion, Ringer lactate solution and mannitol solution. The selection of parenteral solution is dependent on the patient's condition as 5% dextrose infusion is avoided in diabetic patients.

Cisplatin is actively uptaken by probenecid-inhibitable organic ion transporters resulting in an enrichment of cisplatin in proximal tubular epithelial cells[18, 19, and 20]. The kidney accumulates cisplatin to a greater degree than other organs and is the major route for its excretion[10]. The cisplatin concentration in proximal tubular epithelial cells is about five times the serum concentration.[10, 21]. Unbound cisplatin is filtered at the glomerulus (80% of a dose is excreted in 24 hours). Renal blood flow can decrease within three hours after cisplatin infusion, and glomerular filtration (GFR) falls after the decrease in renal blood flow[10]. Hyperhydration and mannitol is beneficial in eliminating this accumulated cisplatin in kidney by creating a condition of diuresis.

Statistical analysis showed that low dose cisplatin group and high dose group resulted in almost equal degree of nephrotoxicity. This result ruled out the total dose of cisplatin given in different protocols but the important factor of inducing toxicity might be the rate of administration. In our study, rate of administration of cisplatin was kept equivalent in all types of protocols. Hence, it seems that rate of administration is of more value than the total dose of protocol. Also, the similarity of the result may be due to factors like hydration. But still difference exists in number of individual confronting severe nephrotoxicity as there is only one case of severe nephrotoxicity in low dose group.

Cisplatin causes direct tubular injury through multiple mechanisms[10]. High concentrations of cisplatin induces necrosis in proximal tubule cells, whereas lower concentrations induce apoptosis through a caspase-9-dependent pathway[10, 22]. The severity of necrosis is dose and time-dependent[21]. At least two mechanisms contribute to cell death following cisplatin treatment, inhibition of DNA synthesis and glutathione depletion-induced oxidative stress[18, 21, 23]. Cisplatin induced nephrotoxicity is more profound in elderly people. Consistent with an earlier report, our study showed that patients who developed nephrotoxicity tend to slightly older[24, 25]. This might be due to impairment of renal functions with the passage of age. As the age increases renal functions of the individual renders less efficient naturally. This results in decreased excretion of drugs from this route and concentrating in the blood causing toxicity. Similarly, as GFR decreases, cisplatin accumulates in epithelial cells of kidney of elder patients creating severe consequences of nephrotoxicity. Urine concentration/dilution also changes due to imbalanced endocrine hormone production[17].

Cisplatin also causes disturbances in serum electrolytes by changing the filtration and absorption at nephron level and causing gastrointestinal side effects. Most of the patients waste sodium, potassium, magnesium and calcium in their urine and some have orthostatic hypotension[10, 24]. Among these electrolytes, magnesium is of extreme importance that turns to chronic hypomagnesaemia. This decreased magnesium is the prime reason of tetany. Additional factors for worsening tetany are excretion of calcium (hypocalcaemia) and neurotoxicity because of cisplatin. Hypomagnesaemia is controlled by starting magnesium supplementation. This supplementation reduces the episodes of tetany in spite of hypomagnesaemia or convulsion up to and until the completion of chemotherapy. That is why there was no report of tetany or convulsion during the whole study, although such complications are well documented. Another aspect of considerable importance about hypomagnesaemia is that cisplatin induces magnesium depletion, and magnesium deficiency itself may enhance cisplatin nephrotoxicity[10]. Cisplatin also reduces absorption of magnesium from gastrointestinal tract by disturbing the normal functions of GIT.

Another side of electrolyte depletion due to cisplatin induced nephrotoxicity is depletion of chloride ions along with sodium. Cisplatin is a platinum coordinate complex with two labile chloride groups[25]. Cisplatin can form monohydrated complexes by hydrolytic reactions[10]. Its toxic effect is augmented when the intracellular chloride concentration is low, which favors the conversion of cisplatin through the replacement of two chloride ligands by hydroxyl groups to positively charged reactive and toxic aquatic derivative[25] . Using hypertonic saline to reconstitute cisplatin can decrease the amount of monohydrated complex formed[10]. This approach attenuates nephrotoxicity but may also compromise its antitumor activity[10, 26]. This is also a good alternate for the patients who are diabetic.

Conclusion

It is concluded from the present study that cisplatin induced nephrotoxicity is independent of the dose of cisplatin, either low (≤30 mg/m^2) or high (≥70mg/ m^2), and number of antineoplastic drugs in protocol and the protocol itself. All protocols are almost equally nephrotoxic towards the selected population. Nephrotoxicity is the matter of rate of administration of cisplatin. Preventive measures like hyperhydration can only reduce the degree of nephrotoxicity rather than elimination of it. Age is directly proportional to the percentage of nephrotoxicity. Elder patients are more inclined towards being nephrotoxic.

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Attention deficit hyperactivity disorder (ADHD) symptoms and Adult ADHD Diagnosis in adult men with cannabis dependence

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Abstract

Objective: We aimed to demonstrate the existence and intensity of Adult Attention Deficit Hyperactivity (A-ADHD symptoms) in cannabis dependent individiuals compare them with healthy controls and discuss the importance of comorbidity of A-ADHD.

Methods: Seventy patients participated with informed consent. The participants were selected from patients who underwent inpatient treatment in the Department for Addiction at Samsun Neuropsychiatry Hospital. Diagnostic interviews were conducted for cannabis dependence syndrome (ICD 10; DSM-IV); the earliest interview was after 21 days of detoxification therapy. For assesment, the Adult ADD/ADHD DSM IV based Diagnostic Screening and Rating Scale developed by Prof. Dr.Turgay, former Director of the Toronto ADHD Clinic, Ontario, Canada was used. Mean ADHD total and subscale scores were compared by using the group variable independent t test. The analyses were conducted using SPSS for Windows 16.00.

Results:. Considerably higher scores were observed in cannabis dependent individuals.Twenty-four patients were re-evaluated and interviewed and Adult ADHD was diagnosed. All three subdimensions of the Turgay Adult ADHD Scale were found to be statistically higher in the cannabis dependent patients.

Conclusions: As this study shows, Adult ADHD is highly represented in cannabis dependent patients.(in our sample 35% of patients were diagnosed with Adult ADHD). This study underline importance of the ADHD diagnosis in Turkey.

Key words: Adult ADHD, cannabis dependency, substance use

Introduction

Cannabis (marijuana) is obtained from the flower seeds and dried leaves of the *Cannabis sativa* plant (Kumar, Chambers & Pertwee, 2001). The use of cannabis has increased since ancient societies and this increased consumption has become an international problem throughout years. Beside alcohol and cigarettes, cannabis is the most widely used psychoactive substance in the world. According to 2005 data from the European Monitoring Center for Drugs and Drug Addiction (EMCDDA), cannabis is the main drug among %30 of all individuals seeking treatment for substance related disorder, 12% of the individuals actually undergoing treatment. (EMCDDA, 2005). In 2008, the United Nations reported that prevalence e of cannabis use was 2.9-4.3% in the world's adult population, and 0.6% of adults reported using cannabis on a daily basis (WHO., 2010). Short- or long-term cannabis use has several effects on the immune system, respiratory system, cardiovascular system and central nervous system, including cognitive effects in attention.

In the 1970s, cannabis use was not thought to lead to tolerance, so the drug was not recognized as causing withdrawal symptoms. However, this perspective relied on a limited definition of drug addiction described with tolerance and withdrawal symptoms. The established views have since evolved after a series of follow-up and experimental studies in the mid-1970s (Johns, 2001).

Morgenstern, Langenbucher and Labouvie (1994) have shown that cannabis dependence is a valid diagnosis for substance dependence. Based on the Epidemiological Catchment Area (ECA) study, Hall and Solowij (1997) found that 17% of individuals who use cannabis more than five times in their lifetimes are diagnosed with dependence. In a birth cohort study in New Zealand, 9% of 21-year-old individuals who had previously used cannabis were diagnosed with dependence (Thomas, 1996).

In the last decade, the frequency of cannabis use for its stimulating effect has increased substantially among young people in Western Europe. In the last decade, cannabis-related disorders have increased two-fold in European Union countries, and a similar increase was reported in the US (EMCDDA, 2005). In a survey of 11,989 primary school students and 12,270 secondary school students in 9 large cities in Turkey, the rate of cannabis use was 1.2% among primary school students and 4.0% among secondary school students (Ogel et al., 2004). Cannabis use is an important problem also in adults, however no epidemiologic data exist in adults in Turkey.

Comorbid psychiatric disorders are common in cannabis dependence (Arendt & Joersen, 2004; Marijuana Treatment Project Research Group, 2004). Of the limited number of additional diagnoses that were examined, depression and conduct disorder were the most common. These additional diagnoses were not compared with healthy control groups. Other studies show that comorbidity in cannabis dependence complicates treatment, decreases the period of sobriety and increases the frequency of relapse (Dennis, Godley & Diamond, 2004; Moore & Budney, 2003).

Attention deficit hyperactivity disorder (ADHD), which is conceptualized as an attention deficit, hyperactivity and impulsivity, is the most common childhood psychiatric disorder. Studies have shown that ADHD affects 2-12% of school-age children, and the symptoms persist into adulthood in approximately 60% of individuals (Wilens, Faraone, Biederman, et al., 2003; Biederman, Mick & Faraone, 2000).

Current epidemiological data suggest a prevalence rate of 4% in adults (Fayyad, De Graaf & Kessler, 2007; Kessler, Adler & Barkley, 2006). Although there is insufficient data on the prevalence rate of adult ADHD in Turkey, clinicians are increasingly aware of the importance of ADHD diagnosis and treatment.

Comorbidity is common in ADHD, and 90% of cases represent with other psychiatric disorders. The prevalence of substance use is reported to be 15% in the general population, but as high as 50% in adult adhd (Katusic, Barbaresi & Colligan, 2005). No significant difference was observed regarding the substance preferences among individuals with substance use disorders that were comorbid with ADHD, but cannabis is most commonly abused after alcohol and cigarette. (Schubiner, Tzelepis& Isaacson1995).

All of the studies indicate that ADHD constitutes a significant risk factor for substance use disorders.

Objective

The aim of this study is to demonstrate the existence and intensity of ADHD symptoms in cannabis-dependent individuals and compare with adhd symptoms of healthy individiuals in order to discuss the importance od adult adhd diagnosis in cannabis dependent individiuals.

Materials and methods

The study included male patients who underwent inpatient treatment at the Research and Treatment Center for Alcohol and Drug Addiction clinic (AMATEM) in the Samsun Hospital for Psychiatric Disorders. A total of 70 patients were diagnosed with cannabis dependence according to the ICD-10 and DSM-IV diagnostic criteria. The patient group was diagnosed by a psychiatrist. Patients who used substances in addition to nicotine and cannabis were included and patients with comorbid psychotic disorders, mood disorders or any other psychiatric disorder were excluded from the study. Additionally, 70 healthy volunteers were included as a control group.

At the end of the 21-day detoxification of the patients and psychiatric interview with SCID and ICD, the participants were assessed with the Adult ADD/ADHD DSM IV based Diagnostic Screening and Rating Scale. The scale was developed by Prof. Dr.Turgay, former Director of the Toronto ADHD Clinic, Ontario, Canada. It is a self assessment sca-

le. The reliability, validity, and transliteral equivalance study had been performed by Günay et.al in 2005 (Günay 2006). The scale includes an attention deficit subscale, a hyperactivity subscale, a related problems subscale and the total score.

The analyses were conducted using the software program SPSS for Windows (version 16.00). Chi-square tests were used in the group comparisons to assess the relationships between the categorical variables. Independent t-tests were employed to assess the difference between the group means.

Results

The mean age, demographic factors and levels of education for the 70 male patients were not significantly different from those of the control group.

For the Adult Attention Deficit and Hyperactivity Scales, a statistically significant difference was observed between the patient and control group for the attention deficit subscale, hyperactivity subscale, related problems subscale and total scores ($p<0.001$ for all variables) (**Table 1**). In all of the assessment scales, the total scores were higher in the patient group than in the control group. Based on the subscale and total scores, the entire patient group was observed to have ADHD symptoms and to be at a high risk for ADHD.

Twenty-four of the 70 patients were evaluated as having a high risk for ADHD. All of these 24 patients were diagnosed with ADHD after the clinical interviews. The differences and the standard deviations of the differences of the mean subscale and total scores between the patient and control groups are provided in **Table 2**. Five individuals in the control group received high-risk scores on the attention deficit subscale, and no individuals in the control group received high-risk scores on the hyperactivity or related problem subscales. These individuals were re-interviewed, and none of them were diagnosed with ADHD.

Discussion

The aim of this study was to demonstrate the existence and intensity of Adult ADHD symptoms in cannabis-dependent individuals. In our study, 35% of the patients who were receiving treatment for a diagnosis of cannabis dependence were diagnosed with comorbid ADHD.

Although ADHD is well known in childhood and persistence of the diagnosis and duration of adhd symtoms into adulthood have been accepted, little is known about cannabis dependence in adult ADHD.

There is no single e etiologic explanation for ADHD, but there is evidence to support several hypotheses. Dopamine (DA) and noradrenaline (NA), which is synthesized from DA, play an important role in cognitive functions, such as attention, concentration, motivation and wakefulness (Arnsten, 2011). Individuals with ADHD respond positively to antidepressants and central nervous system stimulants (methylphenidate, d-amphetamine and pemoline) that increase dopamine and noradrenaline levels in the brain, which appears

Table 1. The subscales of the Adult Attention Deficit and Hyperactivity Scales and the total scores

	Cannabis-dependent group (n=70)	Control group (n=70)	*p* Value
Attention deficit subscale	69.09±24.87	45.05±22.52	p<0.001
Hyperactivity subscale	71.79±15.26	44.45±21.70	p<0.001
Related problems subscale	73.77±14.63	44.89±23.42	p<0.001
Total scores	71.75±18.25	44.79±22.54	p<0.001

Table 2. The differences in the mean subscale and total scores between the patient group and the control group according to group variables and standard deviation values of the differences

	Mean difference	Standard deviation	95% confidence interval (lower-upper limit)
Attention deficit subscale	7.45	1.17	5.09-11.76
Hyperactivity subscale	9.15	1.41	6.34-14.33
Related problems subscale	24.38	4.11	21.07-74.43
Total scores	40.98	5.34	30.39-51.57

to support the idea that ADHD is a catecholamine metabolism disorder. Stimulants increase the release of catecholamines and reduce the withdrawal. In Carrol and Rounsaville's (1993) study on alcohol and psychoactive substance use, 34.6% of treatment-seeking cocaine users also met the diagnostic criteria for childhood ADHD. This result can be regarded as the attempts of cocaine users with ADHD symptoms in childhood to self-medicate, or it can be interpreted as a presynaptic or postsynaptic pathology in the dopaminergic pathways of adult ADHD. Because cannabis begins to affect users by increasing their dopamine release, the prevalence of ADHD in cocaine users may be considered to follow a mechanism similar to that of cannabis dependence (Pierce & Kumaresan, 2006). In a meta-analysis of a retrospective study and four prospective studies that were conducted among children who were and were not receiving treatment for ADHD, there was nearly a twofold increase in the risk of substance abuse among the children who were receiving no treatment (Wilens, Faraone & Biederman, 2003). ADHD is recognized as an independent risk factor for alcohol and substance use. Between 9-30% of ADHD patients also develop patterns of substance abuse and dependence. Research has indicated that alcohol and substance use adversely affect the course of ADHD; compared with individuals without ADHD, individuals with ADHD begin using substances at earlier age with rapid transformation from substance abuse into the substance dependence and substance use becomes more intense and frequent. In this study, 35% of our patients who were treated for cannabis use disorder were diagnosed with ADHD in clinical interviews. This figure shows that cannabis use is approximately eight times more common in patients with ADHD compared with the general population. (4.4%) Diagnosis and proper treatment of ADHD in childhood may prevent substance use disorders in adulthood (Biederman, Wilens & Mick, 1999). In this study, none of the patients had received an earlier diagnosis of ADHD.

Similarly to many other developmental psychiatric disorders, there is no definitive diagnostic test for ADHD. There are several tests and scales that lead to the diagnosis of ADHD. The Adult Attention Deficit and Hyperactivity Scale,which was demonstrated by Gunay et al. (2006) to be valid and reliable in Turkey, was employed in the present study. There was a statistically significant difference between the patient and control groups in the attention deficit subscale, hyperactivity subscale, related problems subscale and total scores. Comorbidity with adult adhd is an important issue in addiction treatment and should not be discarded.

Conclusions

In our study, 35% of patients who received treatment for a diagnosis of cannabis use disorder were diagnosed with comorbid ADHD. Effective treatment for cannabis dependence and relapse prevention will be possible with better awareness and treatment of ADHD.

Limitations and restrictions

Because substance use disorders were observed more often and more intensely in men and because institutional structures only accept male patients for inpatient treatment in Samsun, female individuals were not included in this study. This situation prevents the generalization of the findings to female patients. However, the literature shows that 95% of the cases that seek help for cannabis dependence are men, and ADHD is more frequently observed in men. These findings at least partially alleviate the weakness of this study. Another limitation is the number of cases. The sample of individuals in one region requires the consideration of cultural variables. Future prospective studies that make use of more cases that are sampled from different regions will elucidate the relationship between ADHD and cannabis use.

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Quality of Care by Good Medical Records Documentation in Educational Hospitals

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Abstract

Background: Documentation in the medical record facilitates the diagnosis and treatment of patients. Considering the necessity of documentation the data of diabetic patients and its effect on the treatment, a study designed and conducted in order to determine the condition of documentation of medical records.

Methods: This is a retrospective cross sectional descriptive study and the subjects entering the study were all of the diabetic patients referring to the Imam Khomeini and Bo Ali educational hospitals in Sari City, Iran in 2007-2008.

The patient characteristics calculated on a subset of 270 diabetic diseases: 5.6% type I Insulin-dependent diabetes mellitus and 5.2% Type II diabetics, 18.5% was Gestational diabetes.

270 patient records were selected. Then, based on documented data in the admit ion record, summary sheet, history, paramedical tests and checklist were completed. The record data under study included demographic features, clinical history, laboratory examinations, complications and problems, and treatment used. The collected data were analyzed statistically using SPSS software version 17.

Results: The obtained data indicated that 76.95% of the demographic features, 24.3% of clinical history, 6.8% of physical examinations and 30.4% of the examinations documented.

Conclusion: Findings of this study, showed that documentation of process of the patient records in the diabetic patients by the physicians who are the main health care team along with medical students, interns and residents.

Key words: Documentation; diabetes patient records; data collection; Medical records; quality of care

1. Introduction

In order to improve care, information is needed about the characteristics of practices that offer different levels of care, and the obstacles faced by practices in improving care. Knowledge of factors that influence quality of care in diabetes may therefore be helpful in implementing quality improvement programmes (1). The key informant technique is a qualitative research method where an expert source of information is asked to provide deeper insight into what is going on around them (2).

Documentation in the medical record facilitates diagnosis and treatment, communicates pertinent information to the other caregivers to ensure patient safety, reduce medical errors, and serves an important medical-legal function in risk management(3). Quality of documentation may also reflect the quality of care delivered. Although recent studies have suggested that medical record documentation in the outpatient setting tends to underestimate, the actual performance of preventive health care services and other indicators of quality of care (4-6). The core of health information system in the hospital lies in the medical records (7). As a primary means of communication between health care workers, a properly documented medical record is essential to good clinical care. The medical record of today not only reflects care given to the patients, but also has become a communication tool to a wide variety of players (8-11).

The medical record is a document that has traditionally served as a communication tool for members of the health care team. The role of medical record documentation has changed noticeably over time in response to many factors. The art of communicating concisely and accurately in the

medical record serves to provide evidence of the effectiveness of the individualized nutrition care plan developed by the dietetics professional (12). Increasing healthcare litigation highlights the medical record as a legal document of what was done and what was not done (13).

Medical documentation is important for communication among health care professionals, research, legal defense, and reimbursement (14). Since the medical record is the major source of health information, it is necessary to maintain accurate, comprehensive and properly coded patient data (15).

Medical records are commonly used to measure quality of care. However, little is known about how accurately they reflect patients' clinical condition. Even less is understood about what influences the accuracy of provider's documentation and whether patient characteristics affect documentation habits (16).

The medical record serves many purposes but its primary function is to plan for patient care and provide for continuity in information about the patient's medical treatment. As a permanent record, the patient's medical record informs other health care providers both inside and outside the hospital about the medical history of the patient (17).

The hospital medical record has become increasingly exposed to retrospective audits by third party insurers, quality assessment studies, and billing inquiries. As a result, the demand for complete documentation in the record has steadily increased during the past few years. Institutional medical practices are subject to a variety of regulations and standards (18).

To improve the quality of treatment, different tools have been utilized for evaluating the way of coding and way of caring in the medical records as they provide data about the disease, the rendered care and treatment procedures. Thus, it is important in evaluating the quality of care given (19). Problems with medical documentation have arisen from the explosive increase in data-volume, complexity and multiplicity in data-management (19). Problems with medical documentation have arisen from the explosive increase in data-volume, complexity and multiplicity in data-management (20).

Therefore, the first step to solve problems relating to the diabetic patients' records documentation is to prepare a list of the basic information for each diabetic patient. The prevalence of type 2 DM ranges from 1.2% to 14.6% in Asia, 4.6% to 40% in the Middle East, and 1.3% to 14.5 % in Iran (21-23). Considering the necessity for documenting the data for diabetic patients and its effect on the treatment, a study was designed and conducted in order to determine the status of documentation diabetes patient records in the educational hospitals of the Mazandaran University of Medical Sciences, Mazandaran in 2006-2007.

2. Material and Methods

This is a retrospective cross-sectional descriptive study and the subjects entering the study comprised all the diabetic patients referred to the Imam Khomeini and Bo Ali educational hospitals in 2007-2008. In all, 270 patient records were selected. Then, based on the documented data in the admission records, summary sheet, and history, the paramedical tests check list was completed. The record data under study, included demographic features (age, sex, and age at onset of disease), clinical history (family history, habit and history of medication, the physical examination, signs, and symptoms of diabetes) laboratory examinations (blood profile, blood chemistry, enzymes, hematology and urine examination), complications and problems (Diabetic Ketoacidosis), diabetic coma, hyperglycemia, neuropathy, nephropathy, and retinopathy) and treatment (the type of medication) used. The collected data were statistically analyzed using SPSS software version 17.

3. Results

1, 76.95% of data on demographic features (age, sex, type of diabetes, marital status and age at onset of disease) was documented. Also, it was found that of the 270 diabetic patient records under study, 70% of them omitted reports on the type of diabetes. On demographic features, 24.3 clinical history, 6.7 % physical examination and 30.4% of examination were documented. Of 270 diabetic diseases, 5.6% type I Insulin-dependent diabetes mellitus (IDDM), 70.7% and 5.2% Type II diabetics, and 18.5% were Gestational diabetes (or gestational diabetes mellitus, GDM). 70.7% Lack of documenting type of diabetes 21.5% wit-

hout recording age at onset of disease, and 41.1%, the mediation history 89.2%, the diabetic patients' diseases history were not recorded.

Clinical medical records include the history of diseases in 10.76%, family history 5.67%, addiction (smoking, alcohol use etc.).

66.2%, history of medication in 58.19%. The examinations revealed the lowest number reports were on the blood glucose profile in 21.4%, and the highest rate on the urine examination 48.2%. On diabetes complication (diabetes ketoacidosis, diabetic coma, hypoglycemia, neuropathy, nephropathy, and retinopathy, no report was given in 72.5%, diabetic coma with 1.5% and neuropathy with 21.9% were the lowest and the highest rate of given report retrospectively. Also during the study from total number of 270 patient records under study, in 72.2% there were no reports on treatment and in 27.8% data about the type of used medication was given. The obtained data indicated that 76.95% of the demographic features, 24.3% of clinical history, 6.8% of physical examinations and 30.4% of the examinations were documented. From the total 270 diabetic records, 5.6% belonged to the Insulin-dependent diabetes mellitus (IDDM), 18.5% were Gestational diabetes (or gestational diabetes mellitus, GDM), 70.7% did not documented the type of diabetes. 21.15% had no record of age at the onset of the disease, 41.1% no history of medication record and 89.2% no history of disease in diabetic patients

4. Discussions

Findings indicated that 5.6% of the medical records belonged to diabetes type I, 5.2% to diabetes type II and 18.5% gestational diabetes, but in 70.7% of the medical records reports of diabetes, while study of Liesenfeld and et.al (24), 752 consecutive medical reports of patients with insulin- or no insulin- dependent, were investigated the completeness of documentation of indicators of quality of care. The documentation for the IDDM group was more complete compared to the NIDDM group. The comparison of our study with previous work, particularly from Britain, has to keep structural differences in medical care in mind for interpretation, but trends will be similar. These observations underline the need for more structured documentation for diabetic patients in order to improve quality of care. Liesenfeld et.al research showed that 31.5% of diabetic patients were diabetes I and 58.4% diabetes II but only in 7.6% of the type of diabetes was not documented. 76.95% of the patient records were related to demographic elements, and the lowest number on physical examination was 6.8%. Yudkin et.al (25) reported that the detail of diabetes complication was generally not recorded. Yudkin et al. demonstrated that details of diabetic complications often are not recorded in general practice and hospital notes. Nevertheless, they were more often documented for hospital patients. The study of Mashoufi et.al (26) on 1500 medical records documentation showed that principles of documentation by physicians and 2.51% by nurses were considered in 52.4% of the cases. In this study, 27.8% of the recorded documents belonged to the patients with high blood pressure and 2% to the biliary disease and regarding the history of disease to the patients with familiar diabetes with 26.3%, 27.8% of the urinary frequency, laming and dystopia each with 14.8% in the diabetic records. HBA1c which is index blood glucose (27) in long-term blood glucose control of dependent medical documentation in 92% and of 439 insulin independent case 37.6%. There was report of HbA1c. A study by Aryaee et.al on 18 medical records, in 1988 showed that none of them were documented completely (28). Ahmadzadeh showed that medical documentation in the public hospital was satisfactory (29). Project like "Diadoq" (Diabetes Mellitus: Optimizing Care by Knowledge-Based Quality Assurance) in Germany and "Staged Diabetes Management" in the United States are currently working on computer-assisted documentation in diabetes care that can help the general practitioner and hospital physicians to monitor the quality of care delivered to their patients(30). The improvement of quality of care for diabetic patients is at the core of the St Vincent Declaration (31).

5. Conclusion

Despite efforts in recent years to improve the medical records documentation, and train physicians and nurses according to ICD1-10 medical diagnosis writing, problems still exist on proper me-

dical records documentation, as the special form for diabetes provided by Ministry of Health and medical education in Iran is not used. . Therefore, it is proposed that a committee on medical documentation be developed and the interns, physicians and nurses be instructed on the correct method for medical documentation. Also, the distribution and manner of using the special forms on diabetic patient's s is suggested. These observations underline the need for more structured documentation for diabetic patients, to improve the quality of care and documentation. Medical record documentation varies depending on the measure, with room for improvement in most domains. Further study could lead to targeted interventions to improve documentation.

6. Acknowledgements

The authors gratefully acknowledge the vice chancellor for research of Mazandaran University of Medial Sciences for providing research budget and approving the proposal Ms Sayede Shahrbanou Rashida for data collection and reviewing of the medical records from two hospitals.

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Physical activity levels of teachers and health professionals in Turkey

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Abstract

Purpose: The purpose of this study was to examine the physical activity level of teachers and health professionals and to investigate whether there were differences in physical activity level between two separate groups.

Method: To determine the physical activity levels International Physical Activity Questionnaire (IPAQ) was applied to 200 teachers (age; 36.28±6.58**)** including 92 male and 108 female working in primary schools and 200 health professionals (age; 33.63±7.55 years) including 62 male and 138 female working in university hospital. The short-form of IPAQ which includes last one week containing the 7 item has been used to determine the physical activity levels. Mann Whitney-U test was used to evaluate the differences between two groups. The relations of parameters, such as profession, age, gender, branch, height, weight, drug alcohol and tobacco use and marital status with Physical Activity level were analyzed by using Chi-Square test.

Results: The weekly physical activity score of teachers and health professionals were 1544.58 MET-min/week and 1986.59 MET-min/week respectively and no statistically difference was found ($p>0.05$). Health professionals' walking activity and time of sitting were found higher than teachers ($p<0.05$ and $p<0,01$). Physical activity scores were not found significantly different between male teachers and male health professionals ($p>0.05$). Total physical activity scores, walking activity scores and sitting times were found significantly higher in female health professionals than female teachers ($p<0.05$; $p<0.01$).

Conclusion: Total physical activity levels of teachers and health professionals were not different and insufficient. The physical activity level increase in teachers and decrease in health professionals with increasing age and with smoking. Gender difference and marriage affects the physical activity level of teachers but does not affect the health professionals. Physical activity level was not different according to drug, alcohol consumption and BMI in both occupation groups. As a result physical activity levels in terms of some variables differed between two professional groups.

Key words: Physical activity level, teachers, health professionals.

Introduction

As technologies and industrialization continue to progress at a rapid pace, in the 20th century, conditions of life have changed in many countries. The sedentary lifestyle which is potential negativity of these changes causes development of diseases such as cardiovascular disease, diabetes, obesity, some types of cancer and muscular-skeletal problems (1). It has been proven that regular physical activity develops aerobic capacity, muscle strength, body balance, coordination, metabolic function and also provides developing in bone density, lipid profile, insulin levels and immune system functions (2). Balanced diet and regular physical activity are bases of prevention and treatment of lipid metabolism disorders, cardio and cerebrovascular diseases and other mass no communicable diseases caused by high energy-density nutrition and insufficient physical activity (3)

The vast majority of society perceive the term of "sport" as synonymous with physical activity. However physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure, it increases heart and breathing rate and results fatigue by different levels of intensity. In this context, in addition to sporting activity, exercises, variety of games and activities

during the day are considered to be a physical activity (4). The relationship is established between physical activity level and many factors such as heredity, age, gender, socio-economic status, health status, level of education (5).

Measurement of physical activity is important for identifying low physical activity level of persons to encourage them to a higher activity (6). It is important to measure physical activity by accurate and reliable methods. For this reason direct and indirect methods have been developed for measuring. Direct measurement methods are; observation, in-room calorimeter (body heat production), dual-layer water technique, acceleration vectors (accelerometer), motion sensors (pedometer) and a method of logging. Indirect measurement methods are; indirect calorimeter, dietary records (daily energy intake), physiological measurements (cardio respiratory fitness, heart rate, temperature, ventilation) and physical activity questionnaires. Selection of the method varies depending on purpose of the study, characteristics of the participants and work plan (1,7). Surveys are easy to use measurement of physical activity and energy consumption. Besides this method is the most convenient and inexpensive method for studying large populations (7).

Although benefits of regular physical activities are known, recent researches show that physical activity levels of individuals were found to be less than the recommended levels (8). American College of Sports Medicine (ACMS) recommendations for the general population are that all adults accumulate at least 30 min of moderate-intensity physical activity on most, and preferably all days of the week (8). A survey includes 15 European countries reported that physical activity levels were less than 50% of recommended level (9).

This study aimed to detect physical activity level of two separate groups (teachers and health professionals) and also to investigate whether there are any differences in the levels of physical activity between two groups.

Method

Participants

Surveys were applied to 200 teachers (age: 36.28±6.58 years; body height: 1,68±0,08m; body weight: 70.72±12.41 kg) including 92 male and 108 female working in Samsun Central Primary School and applied to 200 health professionals (age; 33.63±7.55 years stature: 1.66±0.07m; body weight: 67.48±12.26) including 62 male and 138 female working in university hospital. The Body Mass Index (BMI) was grouped in 4 different levels as; slim (<19.9kg/m^2), normal (20-24.9 kg/m^2), overweight (25-25.9 kg/m^2) and obese (>30 kg/m^2).

Data Source

The data were collected by face-to-face survey method. General Information Form was prepared by researchers in order to obtain information about occupation, age, gender, industry, size, body weight, alcohol and drug use and marital status of participants.

Physical activity levels were determined by International Physical Activity Questionnaire (10). The validity and reliability of this survey tested in Turkey by Ozturk in 2005 (1). It is recommended to be applied this survey to adults between ages of 18-69. The short-form of IPAQ was used to determine the physical activity level which includes 7 questions for last week.

Short-form total score was calculated by summing the times (minutes) and frequencies (days) of "walking, moderate and severe" activities. The survey includes questions about physical activity lasting at least 10 minutes in a week. MET-min/week score is obtained by multiplication of minutes, days, and the MET values (multiples of resting oxygen consumption). Under resting conditions each person consumes 3.5 ml of oxygen in a minute per kg. Walking score were calculated by multiplication to walking time with 3.3 MET. In calculation, for moderately intense activity 4 MET, for severe activity 8 MET were used.

Physical activity levels were classified as physically "inactive" (<600 MET min / week), "low active" (600-3000 MET-min / week) and "adequate" level of physical activity (>3000 MET-min / week).

Statistical Analysis

Kolmogorov-Smirnov test was used for whether *data* is normally *distributed or not.* It was detected that the data was not normally *distributed and*

Table 1. An example of physical activity level calculation

	Form of physical activity			Total
	Walking activity	Moderate level activity	Severe activity	
MET	3.3 (constant value)	4.0 (constant value)	8.0 (constant value)	
1 day/minute	40	60	20	
week/day	4	3	3	
Total	528 MET-min/week	720 MET-min/week	480 MET- min/week	1728 MET- min/week

Mann Whitney-U test was used to analyze the differences between two groups. Chi-square test was used to detect the physical activity level according to occupation, age, gender, industry, medicine, alcohol and tobacco use, marital status. SPSS 19.0. Version was used for the statistical analyses.

Results

Comparisons of Physical Activity Scores of participants are seen in Table 2. The average total physical activity score was for the teachers 1544.58±96.78 MET-min/week and for the health Professionals 1986.59±139.61 MET-min/week and no significant difference was found between the two occupation group ($p>0.05$). It was determined that walking activity and sitting time were higher in health professionals than teachers ($p<0.05$; $p<0.01$).

Physical activity levels were compared separately for males and females. In males, total physical activity scores were higher in health professional group, however there was not any statistically significant difference between two group of men ($p>0.05$). In females, total physical activity scores, walking activity scores and sitting time were higher in health professional group ($p<0.05$; $p<0.01$).

The teachers physical activity levels were; 27.5% "inactive", 61.5% "low active", 11% "adequate" respectively (Table 4). And the health professional's physical activity levels were; 27% "inactive", 51.5% "low active", 21.5% "adequate" respectively. As a result the vast majority of the subjects in our study were at "low active" level.

For teachers, as the age increased, the adequate physical activity level increased ($p<0.05$). The "adequate" physical activity level was found in 22.4% of teachers who are older than 41 years, in 4.9% of teachers who are 20-30years and 8.2% of teachers who are 31-40years. However in health professional group, there was not any statistically significant difference according to the age ($p>0.05$).

Teachers' physical activity level was examined by gender. While men's physical activity levels were; 18.5% "inactive", 64.1% "low active", 17.4% "adequate"; women's physical activity levels were; 20.6% "inactive", 45.4% "low active", 34 % "adequate". The physical activity level were found different between two gender groups ($p<0.01$). However in health professional group, there was no statistically significant difference according to the gender ($p>0.05$).

Table 2. Comparison of physical activity scores between teachers and health professionals

Physical Activity Level (MET-min/week)	Occupation	n	Mean	Standard Error	Mann Whitney-U	p
Severe activity	Teacher	200	446.55	56.17	17694.500	,112
	Health Professional	200	352.16	53.98		
Moderate activity	Teacher	200	276.45	32.06	19989.000	,992
	Health Professional	200	302.30	43.28		
Walking Activity	Teacher	200	817.40	56.97	**17439.000**	**,027***
	Health Professional	200	1314.49	117.35		
Total Activity	Teacher	200	1544.58	96.78	18364.000	,157
	Health Professional	200	1986.59	139.61		
Sitting time	Teacher	200	258.93	9.668	**17011.000**	**,009****
	Health Professional	200	290.25	9.636		

*$p<0.05$ **$p<0.01$

Table 3. Comparison of physical activity scores between men and women

Physical Activity Level (MET-min/week)	Gender	Occupation	n	Mean	Standard Error	Mann Whitney-U	p
Severe activity	Men	Teacher	92	737.83	93,723	2299.000	0.066
		Health Professional	60	586.67	132,056		
	Women	Teacher	106	193.74	56,035	6636.500	0.240
		Health Professional	134	247.16	48,886		
Moderate Activity	Men	Teacher	92	269.02	42,156	2727.500	0.628
		Health Professional	62	376.13	82,911		
	Women	Teacher	108	282.78	47,454	7416.500	0.945
		Health Professional	138	269.13	50,430		
Walking Activity	Men	Teacher	92	937.12	91,493	2451.000	0.139
		Health Professional	62	1487.11	226,684		
	Women	Teacher	108	715.41	70,042	**6287.000**	**0.035***
		Health Professional	138	1236.93	136,271		
Total Activity	Men	Teacher	92	1941.68	169,139	2746.000	0.696
		Health Professional	62	2427.11	302,390		
	Women	Teacher	108	1206.30	95,987	**6223.000**	**0.026***
		Health Professional	138	1788.67	147,717		
Sitting time	Men	Teacher	92	271.63	14,287	2777.000	0.780
		Health Professional	62	284.03	19,252		
	Women	Teacher	108	248.10	13,102	**5751.500**	**0.002****
		Health Professional	138	293.04	11,006		

**p<0,05 **P<0.01*

Table 4. Physical activity levels in teachers and health professionals according to age, gender and branches

	Occupation	Years	Physical Activity Level								X^2
			Inactive		Low active		Adequate		Total		
			n	%	n	%	n	%	n	%	
Age Group	Teacher	20-30 (1)	13	31.7	26	63.4	2	4.9	41	100	9.542* 3≠1,2*
		31-40 (2)	29	26.4	72	65.5	9	8.2	110	100	
		41 and over (3)	13	26.5	25	51*	11	22.4*	49	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	20-30 (1)	24	28.9	38	45.8	21	25.3	83	100	4.898
		31-40 (2)	18	23.4	41	53.2	18	23.4	77	100	
		41 and over (3)	12	30	24	60	4	10	40	100	
		Total	54	27	103	51.5	43	21.5	200	100	
Gender	Teacher	Men (1)	17	18.5**	59	64.1	16	17.4**	92	100	11.561** 1≠2
		Women (2)	38	35.2**	64	59.3	6	5.6**	108	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Men (1)	16	25.8	30	48.4	16	25.8	62	100	0.992
		Women (2)	38	27.5	73	52.9	27	19.6	138	100	
		Total	54	27	103	51.5	43	21.5	200	100	
Branches	Teacher	Physical Education (1)	1	7.7**	8	61.5	4	30.8**	13	100	13.742** 1≠2,3
		Class (2)	20	31.3	33	51.6	11	17.2	64	100	
		Other branches (3)	34	27.6	82	66.7	7	5.7	123	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Doctor (1)	6	19.4	14	45.2	11	35.5	31	100	9.796
		Nurse (2)	18	29.5	27	44.3	16	26.2	61	100	
		Biologist (3)	9	23.7	25	65.8	4	10.5	38	100	
		Others (4)	21	30	37	52.9	12	17.1	200	100	
		Total	54	27	103	51.5	43	21.5	200	100	

**p<0.05 **p<0.01*

Significant differences were found between physical activity level and branches for teachers ($p<0.01$). "Adequate" physical activity level was found in 30.8% of physical education teachers, 17.2% of class teachers and 11% of the other branch teachers. There was no significant differences in health professional group between physical activity levels and related branches ($p>0.05$).

In both groups, there were no significant differences according to drug, alcohol consumption and

Table 5. Physical activity level in teachers and health professionals according to pharmaceuticals, smoking, alcohol consumption.

	Occupation		Physical Activity Level								X^2
			Inactive		Low active		Adequate		Total		
			n	%	n	%	n	%	n	%	
Drug use	Teacher	Yes	8	24.2	21	63.6	4	12.1	33	100	0.227
		No	47	28.1	102	61.1	18	10.8	167	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Yes	6	15.8	24	63.2	8	21.1	38	100	3.426
		No	48	29.6	79	48.8	35	21.6	162	100	
		Total	54	27	103	51.5	43	21.5	200	100	
Smoking	Teacher	Yes	20	32.8	34	55.7	7	11.5	61	100	1.384
		No	35	25.2	89	64	15	10.8	139	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Yes	47	30.7	78	51	28	18.3	153	100	6.469*
		No	7	14.9	25	53.2	15	31.9	47	100	
		Total	54	27	103	51.5	43	21.5	200	100	
Alcohol consumption	Teacher	Yes	5	21.7	15	65.2	3	13	23	100	0.471
		No	50	28.2	108	61	19	10.7	177	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Yes	12	40	14	46.7	4	13.3	30	100	3.464
		No	42	24.7	89	52.4	39	22.9	170	100	
		Total	54	27	103	51.5	43	21.5	200	100	

*$p<0.05$

Table 6. Physical activity level in teachers and health professionals according to BMI and marital status

	Occupation		Physical Activity Level								X^2
			Inactive		Low active		Adequate		Total		
			n	%	n	%	n	%	n	%	
BMI	Teacher	Slim	0	0	4	80	1	20	5	100	3.792
		Normal	27	27.3	63	63.6	9	9.1	99	100	
		Overweight	26	30.2	50	58.1	10	11.6	86	100	
		Obese	2	20	6	60	2	20	10	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Slim	2	28.6	3	42.9	2	28.6	7	100	5.312
		Normal	28	24.8	59	52.2	26	23	113	100	
		Overweight	17	26.2	35	53.8	13	20	65	100	
		Obese	6	42.9	6	42.9	2	14.3	14	100	
		Total	54	27	103	51.5	43	21.5	200	100	
Marital status	Teacher	Married	51	30.7	96	57.8	19	11.4	166	100	10.048*
		Single	4	9.1	27	81.8	3	9.1	34	100	
		Total	55	27.5	123	61.5	22	11	200	100	
	Health Professional	Married	37	29.1	65	51.2	25	19.7	127	100	1.127
		Single	17	23.3	38	52.1	18	24.7	73	100	
		Total	54	27	103	51.5	43	21.5	200	100	

*$p<0.05$

physical activity levels. In health professional group there was a statistically significant differences between activity level and smoking (p<0,05). Users of cigarette (30.7%) were in "inactive" group.

In both groups, there were no significant differences in physical activity levels according to BMI and (p>0.05). When participant's physical activity levels examined by marital status, 30.7% of married teachers were in "inactive" group, 9.1% of single teachers were in "inactive" group. It was found that, in teachers physical activity levels was effected by the marital status (p<0.05). However in health professional group, marital status did not affect the physical activity levels (p<0.05).

Discussion

A number of recent studies have shown that regular physical activity is beneficial for patients with different health problems and also for more healthy individuals and communities physical activity should be encouraged. It is clear that for having a long and quality life increased physical activity (PA) level is needed (4). Current physical activity recommendations for the general population are that all adults should perform at least 30 min of moderate-intensity physical activity, and preferably in all days of the week (11). A physical activity habit varies according to cultural background, socioeconomic level, individual differences and health status (7).

In this study, physical activity levels of teachers and health professionals were examined by short form of the International Physical Activity Questionnaire (IPAQ). Total physical activity scores were found 1544.58±96.78 MET-min/week for teachers and 1986.59±139.61 MET-min/week for health professionals. The mean total physical activity scores of health professionals were higher than teachers but this difference was not statistically different. While "severe", "moderate" and "total" physical activity showed no *significant differences between* teachers and health professionals, walking activity and sitting time were higher in health professionals than teachers.

In a study that examined university teaching staff, the maximum activity was "walking activity" with 48.3 % (5). In another study, physical education teacher's physical activity levels were; 41.6 % inactive, 41.6% moderate and 16.8% high active, respectively (12). These results indicate that, physical activity levels are generally not adequate in different occupational groups.

In the present study, both groups of teachers and health professionals, the most frequent form of physical activity was "walking activity", "severe activity", "moderate level" and lastly "sitting activity" respectively. In a study that examined university students in health sciences, "walking activity" was determined the most frequent form of physical activity, then "sitting activity" and lastly "high" and "moderate" activity were determined respectively (7). In a recent study, Vural et al. examined desk working persons and reported the frequency of physical activity were; sitting, walking, high physical activity and moderate activity, respectively (4).

In our study, when men and women were evaluated separately, total physical activity score was higher in male health professionals' (2427.11±302.39 MET-min/week) than male teachers (1941.68±169.139 MET- min/week), but this difference was not statistically. Furthermore, female health professionals total physical activity score was (1788.67 ±147.717 MET- min/week) higher than female teachers (1206.30±95.987 MET- min/week). In a different study which examined the physical education teachers, total physical activity score of males were 1607 MET- min/week and females were 999 MET- min/week (12). Our total physical activity scores of teachers were higher than Arabacı and colleagues found (12). In another study which examined the physical activity level of university students, total physical activity score of girls was 1812.30±1569.40 MET- min/week and boys were 2237.74±1589.45 MET- min/week (13). In the study of Savcı et al., total physical activity score of girls and boys were lower than our female health professionals. And total physical activity score of boys were also lower than our male health professionals (13). These results show that health professionals' physical activity scores were higher than most of the other general population.

It is detected in our study that 61.5% of teachers and 51.5% of health professionals were in "low active" group. As well as Arabacı et al. reported 41.6% of physical education teachers and 68 % of students in health sciences were also in "low active" group (12). Bas Arslan et al. have studied with 207 university students and they reported for the

girls 28.7% was sedentary, 30.7% was "active" and 41% was high active; for the boys, 16.9% was sedentary, 21.7% was active and 65 % was high active (7). In the present study, 27.5% of teachers and %27 of health professionals were inactive and only 11% of teachers and 21.5% of health professionals were in adequate activity level.

In the current study physical activity levels were examined according to age. The teachers', whose age is 41 years and over, physical activity level (22.4%) is more adequate than the other age groups. Oppositely the health professional', whose age is 41 years and over, physical activity level is less adequate (%10) than the other age groups but the difference was not statistically. This finding shows that, the physical activity level increase in teachers and decrease in health professionals with increasing age. It's surprising that only 4.9% of teachers' physical activity level is adequate between the 20-29 ages. Similarly, in the study of Vural et al., physical activity level increases with increasing age. Adequate physical activity was found higher in the 40 and upper age group (2). In the previous study, which found positive correlation between physical activity and age in physical education teachers, supports our findings (12).

In our study, male teachers had higher level of physical activity than female teachers. There was no significant difference between the sexes among health professionals. In 2006, a study conducted with university students; there were no statistically significant difference in sitting activity scores of male and female students. However, in boys, total physical activity, moderate intense activity, high activity, and walking activity scores were higher than girls (13). Bas Arslan et al. reported that "high physical activity" was higher in boys; "moderate physical activity" was higher in girls (7). In 2010 a study conducted with individuals working at desk, adequate physical activity level was lower in females than males (4). Previous studies show that males have higher physical activity levels than females (14,15,16). In the present study when the physical activity level compared between the branches, physical education teachers' activity level is more adequate than the other branch teachers.

Physical activity level was not different according to drug and alcohol consumption in both occupation groups. However a user of cigarette was higher in health professionals group. Also there was a significant difference between the physical activity level of smoking and non-smoking group in health professionals. While 30.7% users of cigarette were in "inactive group" , 14.9% of non-users were in "inactive group". Burton and Turrel reported that physical inactivity is higher among smokers (17). Also in the current study it can be said that, smoking can affect the physical activity level in health professionals.

We examined the level of physical activity according to body mass index (BMI), 63.6% of teachers who had normal BMI were in "low active group". Besides 53.8% of health professionals who had high BMI were in "low active group". In both occupation group there was no significant differences between level of physical activity according to body mass index ($p>0.05$). Similarly, a study conducted with university students, there was no significant differences in the level of physical activity according to BMI (12). In a previous study, among the subjects whose BMI were below and above 25kg/m^2 the physical activity points were not different (14).

In the current study, marital status was not different the physical activity level in health professionals. However physical activity levels found different between single and married teachers. In terms of physical activity, the rate of married and also non-active teachers (30.7%) found to be higher than single teachers (9.1%), this finding concluded us that marriage reduces the physical activity. Similarly Burton and Turrel reported that parents have children do less physical activity than non-married (17).

A 5-year follow-up study showed that a level of physical activity of Turkish society is low and also physical activity level of women decreased with time (18). In a study of faculty members, low level of physical activity was found (5). In consistent a study conducted with young adults, similarly showed low level physical activity results (6). In another study that examined desk working persons, the physical activity levels were found to be inadequate but this was not related with life quality (4). Different study conducted with 250 physical education teachers showed the level of physical activity inadequate or close to inactivity.

In conclusion, the total physical activity levels of teachers and health professionals were not dif-

ferent and insufficient. The physical activity level increase in teachers and decrease in health professionals with increasing age and with smoking. Gender difference and marriage affects the physical activity level of teachers but does not affect the health professionals. Physical activity level was not different according to drug, alcohol consumption and BMI in both occupation groups. As a result physical activity levels in terms of some variables differed between two professional groups

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Extracellular signal-regulated kinase1/2 signalling pathway regulate the secretions of human bronchial smooth muscle cells passively sensitized by asthmatic serum

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Abstract

Objectives: To investigate the role of extracellular signal-regulated kinase 1/2 (ERK1/2) signalling pathway in the secretion of human bronchial smooth muscle cells passively sensitized by asthmatic serum.

Methods: Human bronchial smooth muscle cells (HBSMCs) were taken from normal pulmonary tissue in surgery and cultured in vitro treated with normal human serum or asthmatic serum. Epidermal growth factor, PD98059 and ERK1/2 antisense oligonucleotide were used to explore the role of ERK1/2 signaling pathway. The expression of Phospho-ERK1/2 in HBSMCs was analyzed by Western blot. Secretion of HBSMCs was detected by enzyme linked immunosorbent assay and Western blot.

Results: The level of Phospho-ERK1/2 increased in HBSMCs passive sensitized with asthmatic serum compared with normal serum. HBSMCs of asthmatic serum group secreted much more growth factors (TGF- β 1, VEGF and CTGF), cytokines (RANTES and EOTAXIN) and extracellular matrix (Fibronectin and CollangenI) than that of normal controls. Epidermal growth factor stimulated the secretions of both two groups, but the response of chronic asthmatic group was more intense. Both PD98059 and antisense oligonucleotide were able to suppress the secretions of passive sensitized HBSMCs, but antisense oligonucleotide reduced the level of RANTES nearly to that of normal controls, while PD98059 couldn't.

Conclusion: Our results suggest that ERK1/2 signalling pathway may play an important role in the increased secretion of passive sensitized HBSMCs, and ERK1/2 antisense oligonucleotide is capable to slow down the process.

Key words: extracellular signal-regulated kinase; asthma; human bronchial smooth muscle cell; secretion

Introduction

Asthma is characterized pathologically by structural changes in the airway, termed airway remodeling[1]. These changes are associated with worse long-term clinical outcomes and have attributed to the poor therapy in some persistent and severe asthmatics[2]. Several studies demonstrate that human bronchial smooth muscle cells (HBSMCs) play a critical role in airway remodeling not only because of their contraction function, but more important, through the multiple active mediators that they secret in chronic asthmatic status, while the interpretation for the mechanism of this process is still to be identified[3].

Extracellular signal-regulated kinase1/2 (ERK1/2) signalling pathway is one of the most important signalling pathways that transmit the intracellular signal[4]. It is identified that ERK1/2 signalling pathway modulate the proliferation of vascular smooth muscle cells[5]. Recent reports showed that the ERK1/2 pathway regulate epithelial cell secretory function and proliferation[6, 7]. Our previous study showed that ERK1/2 signalling pathway maybe implicate the pathophysiology of chronic asthma[8, 9]. However few reports address about the role of ERK1/2 signalling pathway in the secretion function of HBSMCs in asthma status. The aim of this study is to profile the impact of ERK1/2 signalling pathway on the secretion of HBSMCs passive sensitized with asthmatic serum.

Materials and methods

Serum collection

Seven acute asthma patients and seven healthy controls were recruited. The asthmatics included three males and four females who were (38±9) years old in average and suffered the disease for (7±2) years. The patients hadn't taken steroid since ten days before the episode and presented the total IgE levels higher than 2×10^5IU/L. The healthy controls who never had history of asthma or allergy response constituted of four males and three females and averaged (35±5) years old. All the procedures were approved by the Human Ethic Review Committee of Huazhong University of Science and Technology and received the permissions from all the cases.

Total blood were taken from the body and incubated for two hours in 37℃, and then centrifuged at 3000rpm/min for 10 min. The supernatant was frozen in -80℃ for later use.

Cell culture and identification

Human bronchial smooth muscle was obtained from the lobar or main bronchus of 8 patients of either sex (mean age, 65±6 years old; range, 40 to 78 years old) undergoing lung resection for carcinoma of the bronchus, as previously described in detail[10]. According the method of Liu[11] et al, after removal of the epithelium, portions of the smooth muscle beyond 5cm of the carcinoma were dissected free of adherent connective and parenchymal tissue under aseptic conditions in Hanks' balanced salt solution. The smooth muscle layer was minced into $1mm^3$ fragments and incubated for 20-30 minutes at 37℃ in Ca^{2+} free PSS containing 2g/l collagenase, 5g/l papain, 2g/l bovine serum albumin. After digestion, the separated cells were culture in Dulbecco's modified eagle's medium (DMEM) containing 20% fetal bovine serum (FBS). For identification of HBSMCs, immunofluorescent cytochemical stain was conducted with first antibody (anti-α-smooth musle actin, Santa Cruz Biotechnology, Santa Cruz, CA; 1:100), and visualized for cytoplasm filament under fluorescence microscope.

HBSMCs of passage 3-7 were use for the experiment. The cells were seeded on six- cell plate with 10% FBS-DMEM, and then changed to serum free DMEM for 24 hours synchronization when nearly 70% confluent. After that, HBSMCs were treated respectively with serum free DMEM, 10% healthy control serum, 10% asthmatic serum. The passively sensitized smooth muscle cells were also dealt with 10ng/ml epidermal growth factor (EGF, Accurate chemical&sceintific corpration, Westburg, NY, USA), 30μmol/l PD98059 (Biosourse, USA), both EGF 10ng/ml and PD98059 30umol/l following half hour of pre-incubation with PD98059, transfection of ERK1/2 antisense oligonucleotide or sense oligonucleotide. Twenty-four hours later, all the groups were changed to serum-free medium for next twenty four hours. In the end, supernatant was collected and stored at -20℃. The cells were counted and snap frozen at -80℃ for later determination.

ERK1/2 ODN transfection

The antisense oligonucleotide (ODN) to ERK1/2 was a 18-mer (5'- -AGC AGA TAT GGT CAT TGC -3'). Sense ODN (5'- GCA ATG ACC ATA TCT GCT--3') was used as a control. The phosphorothioate-modified ODN was synthesized by TaKaRa Biotechnology, Dalian, China, part of which was labelled with FITC. Cells were treated with an ODN-Lipofectin mixture at a ratio of 1:2 (0.5 μM ODN) and incubated for 6 h. The cells were then washed to remove the ODN-Lipofectin mixture and incubated for 18 hours in DMEM containing 0.5 μM ODN alone. FITC—labeled ODN turned HBSMCs green when it was taken into the cells under fluorescence microscope, which helped for identification of uptake efficiency.

Western blot analysis

Proteins were extracted from cells with SDS sample buffer, then separated in 8% SDS-PAGE and transferred onto a nitrocellulose membrane. Anti-pan ERK1/2 (R & D Systems, MN,USA, 1:5000) Ab and anti-phospho-ERK1/2 (R & D Systems, MN,USA,1:5000) Ab were used to detect expression of ERK1/2. Antibodies against connective tissue growth factor (CTGF, Abcam England, 1:2500), fibronectin (Abcam England, 1:400) and collagen I(Abcam England, 1:500) also were used to measure the secretions of HBSMCs. Antibody of GAPDH (KangChen Biotech, shanghai, China, 1:1000) was used for protein control.

Immunodetection of first antibodies was performed using a horseradish peroxidase-conjugated

IgG (Santa Cruz Biotechnology, Santa Cruz, CA; 1:5,000-1:20,000). Signals were visualized using an enhanced chemiluminescence (ECL) detection system (Pierce, USA). Protein band intensity was quantified by scanning densitometry.

RT-PCR

Total RNA was isolated using TRIzol (Invitrogen, USA). RT-PCR was performed as described in the RT-PCR kit (TaKaRa, Japan). The primers of ERK1 (233 bp) gene were 5'- CCC TGG CAA GCA CTA CCT - 3' and 5'- CCT CCA CTG TGA TCC GTT- 3'. GAPDH (532 bp) served as endogenous control. The primers of GAPDH were 5'- AGG TCG GAG TCA ACG GAT TTG -3' and 5'- GTG ATG GCA TGG ACT GTG GT - 3'. All the PCR primers used in the present study were designed with primer spans on exons by using Prime Expresss 2.0 software (Applied Biosystem, Foster City, CA, USA) and synthesized by Takara Biology (DaLian, China). The cycling parameters were as follows: 94 ^{o}C 3 min, 94 ^{o}C 30 s, 58 ^{o}C 1 min, 72 ^{o}C 1min, for 35 cycles and followed by the final step at 72 ^{o}C for 10 minutes. The strap of amplified products was analyzed by MUVB-gel analysis system (UltralumCorporation, Claremont, USA). Results were determined by density ratio of purposed band to that of GAPDH.

ELISA

The cell culture supernatants were collected. According to the procedure recommended by the manufacturer, transforming growth factor (TGF-β_1) was quantified using ELISA kits (R&D Systems, MN,USA). Also were vascular endothelial growth factor (VEGF) (Biosource, USA), regulated upon activation, normal T cell expressed and secreted (RANTES) (Biosource, USA) and Eotaxin(Biosource, USA). The values were normalized by the counts of cells.

Statistical analysis

Data were expressed as mean ± standard deviation (SD) and analyzed by one-way ANOVA and q test using SPSS 19.0. P value less than 0.05 was considered statistically significant.

Results

Identification of cultured human bronchial smooth muscle cells

Human bronchial smooth muscle cells demonstrated the typical "peak-valley" shape when grew to confluency at 5-7 days after passage. The cells were identified by fluorescent immunocytochemistry of α-smooth muscle actin antibody. Under fluorescent microscope, HBSMCs (passage 1 or 2) shaped spindle and was stained green >95% for alpha-actin. (Figure 1)

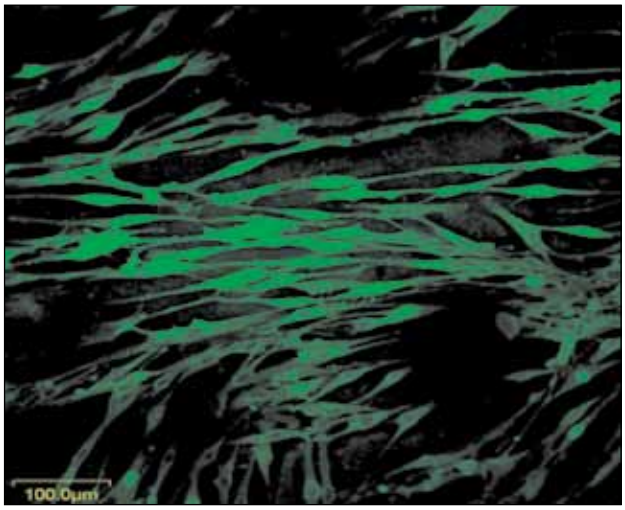

Figure 1. Identification of human bronchial smooth muscle cells by α-smooth muscle actin antibody (fluorescent immunocytochemistry x200)

Transfection of ERK1/2 oligonucleotide to cultured human bronchial smooth muscle cells

After 6 hours of incubation with FITC labeled ODN, the cytoplasm of the cells which took up the ODN would appear green under fluorescent microscope. In contrast to the image in the same field under reverse phase microscope, the positive cells was nearly 82% of the total HBSMCs. (Figure 2)

Expressions of proteins of ERK1/2 and P-ERK1/2 in HBSMCs

With western blot analysis, the protein levels of both ERK1/2 and phospho-ERK1/2 of HBSMCs in normal serum group were significantly increased than those in serum free group. Both ERK1/2 and P-ERK1/2 were markedly stronger expressed in asthmatic serum group than that of normal serum control ($P<0.05$). ERK1/2 antisense ODN dramatically inhibited the protein expressions of

both ERK1/2 and P-ERK1/2 in passively sensitized HBSMCs (P<0.05), while sense ODN didn't work. (Figure 3)

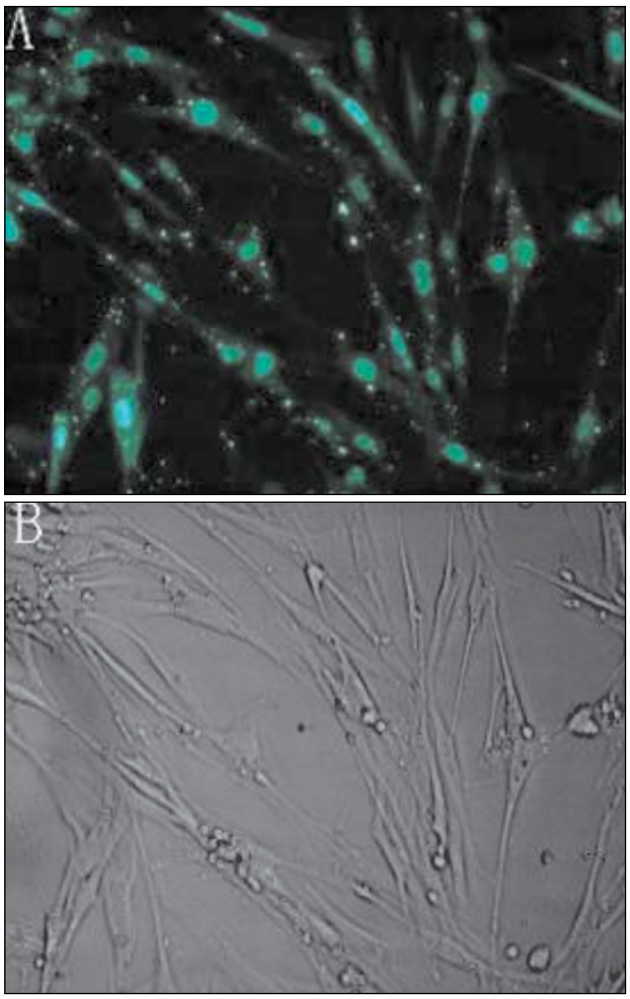

Figure 2. The efficiency of the uptake of FITC-labeled ERK1/2 oligonucleotide in human smooth muscle cells. (A: fluorescent microscope x*100 B: phase microscope* x*100)*

As shown in the top-right graph of figure 3, the ratio of P-ERK1/2 to ERK1/2 which stood for the phosphorylation of ERK1/2 was little different between serum free group and normal serum group. While the cells sensitized by asthmatic serum presented the higher phosphorylation of ERK1/2. ERK1/2 antisense ODN inhibited the protein phosphorylation of ERK1/2 in passively sensitized HBSMCs, while sense ODN didn't work.

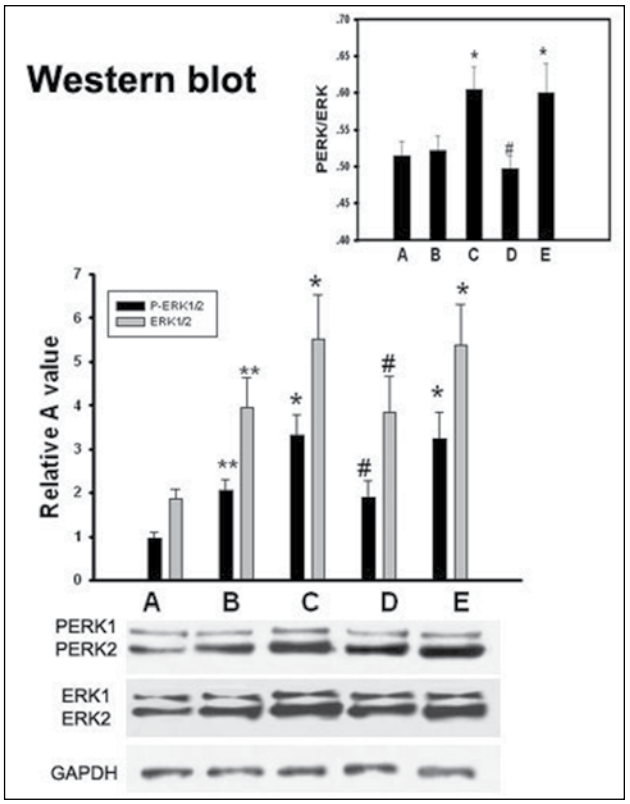

*Figure 3. Protein expressions of ERK1/2 and P-ERK1/2 in human bronchial smooth muscle cells by western blot analysis. (***A** *stands for serum-free group;* **B** *for normal serum treated group;* **C** *for asthmatic serum sensitized group;* **D** *for asthmatic serum sensitized cells transfected by antisense ERK1/2 ODN;* **E** *for asthmatic serum sensitized cells transfected by sense ERK1/2 ODN.*
*** significantly different from group A; * significantly different from group B; # significantly different from group C. P<0.05)*

Expression of ERK1 mRNA in human bronchial smooth muscle cells

With RT-PCR analysis, HBSMCs in normal serum presented higher level of mRNA of ERK1 than those treated with serum-free medium. The asthmatic serum also stimulated the expression of mRNA of ERK1 in HBSMCs. ERK1/2 antisense ODN dramatically inhibited the expression of ERK1 mRNA in passively sensitized HBSMCs. (Figure 4)

ERK1/2 signaling pathway regulate the secretions of TGF-β1 and VEGF in passively sensitized HBSMCs

As showed in figure 5, VEGF was hardly detected in the cultured medium of HBSMCs in serum free group. Both TGF-β1 and VEGF increased

damatically when the cells were cultured with normal serum, and stepped up to the highest level after HBSMCs were sensitized passively by asthmatic serum (P<0.05). EGF stimulated the secretions of both products in passively sensitized cells (P<0.05). Although PD98059 inhibited the secretions of passively sensitized HBSMCs, there was still significant difference between groups of normal healthy serum and asthmatic serum treated with PD98059 (P<0.05). ERK1/2 antisense ODN was capable to restrain the secretions of passively sensitized HBSMCs, but sense ODN showed little effect. (Figure 5)

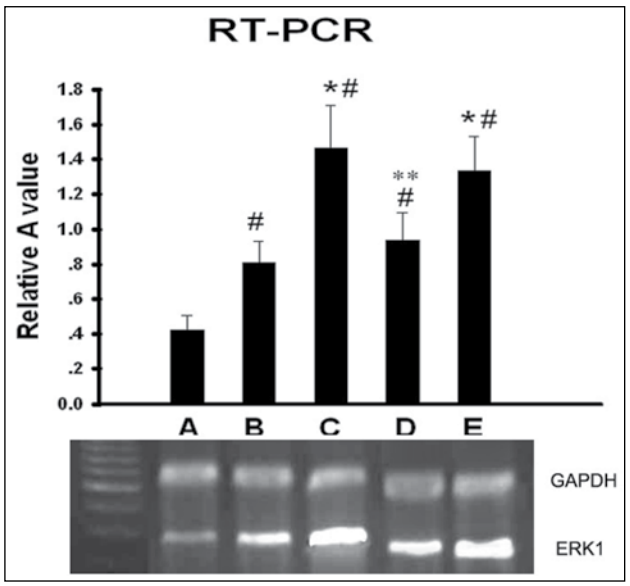

*Figure 4. Results of RT-PCR analysis of ERK1 mRNA in human bronchial smooth muscle cells. (***A** *stands for serum-free group;* **B** *for normal serum treated group;* **C** *for asthmatic serum sensitized group;* **D** *for asthmatic serum sensitized cells transfected by antisense ERK1/2 ODN;* **E** *for asthmatic serum sensitized cells transfected by sense ERK1/2 ODN. # significantly different from group A; * significantly different from group B; ** significantly different from group C. P<0.05)*

ERK1/2 signaling pathway regulated the secretions of cytokines in passively sensitized HBSMCs

HBSMCs of passively sensitized group presented more active secretions of RANTES as well as Eotaxin than those of healthy control (P<0.05). The cells treated with serum-free medium still possessed the lowest secretions of both RANTES and Eotaxin, and even lesss than those of healthy serum (P<0.05). EGF increased the expressions of the two cytokines in passively sensitized cells (P<0.05). PD98059 almost inhibited the irritation of EGF (P<0.05). Antisense ODN showed strong repression to the secretion of these cytokines of passively sensitized HBSMCs (P<0.05), and nearly restored them to the levels of healthy control, while sense ODN took no effect. (Figure 6)

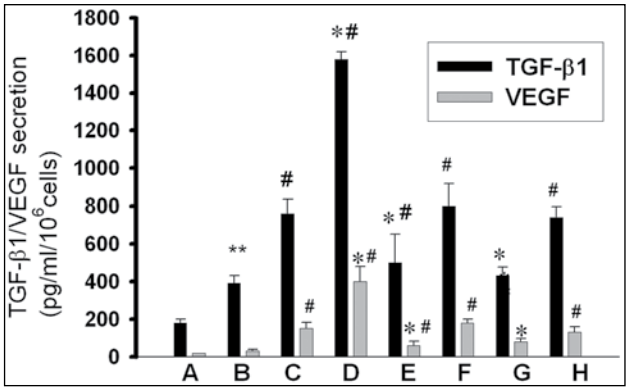

*Figure 5. Secretions of TGF-β_1 and VEGF in human bronchial smooth muscle cells. (ELISA) (***A** *serum free group;* **B** *normal serum group;* **C** *group sensitized with asthmatic serum;* **D** *EGF treated on passively sensitized HBSMCs;* **E** *PD98059 treated on passively sensitized HBSMCs;* **F** *EGF+PD98059 treated on passively sensitized HBSMCs;* **G** *antisense ODN transfected to passively sensitized HBSMCs;* **H** *sense ODN transfected to passively sensitized HBSMCs. ** significant difference from A group, P<0.05; # significant difference from B group, P<0.05; # significant difference from C group, P<0.05.)*

ERK1/2 signaling pathway regulated the secretions of CTGF, fibronectin and collagen I in passively sensitized HBSMCs

With western blot, the synthesis of CTGF, fibronectin and collagen Iwere detected in HBSMCs. The results showed that these products were increased in cells of passively sensitized group compared with those of healthy serum group (P<0.05). EGF stimulated their expressions in the passively sensitized HBSMCs (P<0.05). PD98059 demonstrated the inhibition effect similar with the above described (P<0.05). Antisense ODN decreased the levels of CTGF, fibronectin and collagen Iof passively sensitized HBSMCs nearly to those of healthy controls, while sense ODN didn't work at all. (Figure 7)

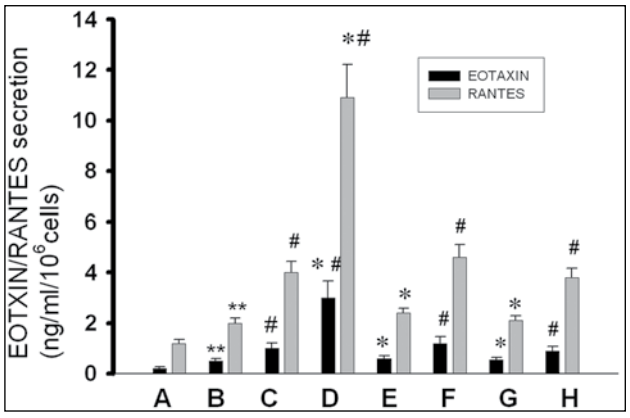

*Figure 6. Secretions of Eotaxin and RANTES in human bronchial smooth muscle cells. (ELISA) (***A** *serum free group;* **B** *normal serum group;* **C** *group sensitized with asthmatic serum;* **D** *EGF treated on passively sensitized HBSMCs;* **E** *PD98059 treated on passively sensitized HBSMCs;* **F** *EGF+PD98059 treated on passively sensitized HBSMCs;* **G** *antisense ERK1/2 ODN transfected to passively sensitized HBSMCs;* **H** *sense ODN transfected to passively sensitized HBSMCs.*
*** significant difference from A group, P<0.05; # significant difference from B group, P<0.05; * significant difference from C group, P<0.05.)*

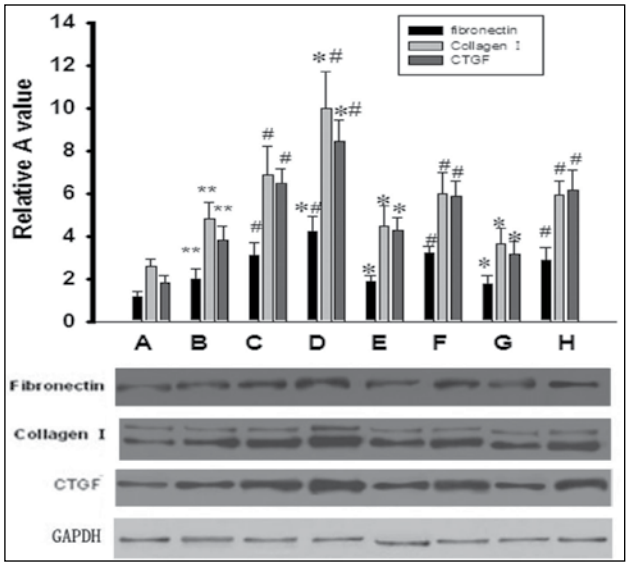

Figure 7. Secretions of Fibronectin, CTGF and Collagen I in human bronchial smooth muscle cells. (Western Blot)
*(***A** *serum free group;* **B** *normal serum group;* **C** *group sensitized with asthmatic serum;* **D** *EGF treated on passively sensitized HBSMCs;* **E** *PD98059 treated on passively sensitized HBSMCs;* **F** *EGF+PD98059 treated on passively sensitized HBSMCs;* **G** *antisense ERK1/2 ODN transfected to passively sensitized HBSMCs;* **H** *sense ODN transfected to passively sensitized HBSMCs.*
*** significant difference from A group, P<0.05;# significant difference from B group, P<0.05;* significant difference from C group, P<0.05.)*

Discussion

Asthma is characterized by the presence of increased numbers of inflammatory cells in the airway in particular eosinophils and Th2 lymphocytes. In addition to the presence of inflammatory cells, the airways of patients with asthma exhibit varying levels of structural changes termed airway remodeling[12]. It has been demonstrated that the phenotypic modulation of airway smooth muscle cells (ASMCs) is important to the pathogenesis of airway remodeling in chronic asthma[8]. Mature airway smooth muscle cells are usually characterized by a low proliferative index and expression of contractile marker proteins such as smooth muscle alpha-actin (sm-alpha-actin), calponin, and smooth muscle myosin heavy chain (sm-MHC)[10]. Emerging evidence shows that airway smooth muscle cells also functions as a rich source of biologically active chemokines and cytokines that are capable of perpetuating airway inflammation in chronic asthma by promoting recruitment, activation, and trafficking of inflammatory cells in the airway milieu[3, 13].

Both TGF-β1 and VEGF are the critical factors that mediate the airway inflammation and remodeling[14]. The cytokine TGF-β has been shown to have a central role in asthma pathogenesis and in mouse models of allergic airway disease. TGF-β1 is the main TGF-β isoform produced after OVA challenge[15]. TGF-beta 1 in addition to an extracellular matrix regulator also could play a key role in bronchial angiogenesis and vascular remodeling via VEGF pathway in asthma[16]. Previous studies had showed that human airway smooth muscle secreted TGF-β1[17], while few results mentioned what happened about the change of secretion of human bronchial smooth muscle cells in asthma status. Our results confirmed that HBSMCs were stimulated to secret more TGF-β1 when passive sensitized by asthma serum than in normal serum. The autocrine of TGF-β1 maybe play a very important role in airway remodeling of chronic

asthma. Previous study seems to stand for that airway epithelium is the likely source for increased VEGF[18, 19]. In this study, the secretion of VEGF from HBSMCs was identified to increase in asthma status. It's not known whether the increased VEGF is the downstream of increased TGF-β1 or just due to the stimulation of asthmatic serum.

RANTES as well as Eotaxin are the important chemotactic factors for eosinophil and airway inflammation in chronic asthma[20, 21]. However, in sputum analysis of chronic asthma patients, principal component analysis revealed that RANTES was not the dominant variable in the chronic persistent obstruction subjects[22]. In this study, asthmatic serum induced the RANTES secretion from HBSMCs in vitro. So it is to be further identified that whether asthmatic HBSMCs secret RANTES in vivo. It is confirmed that airway smooth muscle cells in chronic asthmatic rat secrets much more Eotaxin than normal control[9]. Eotaxin is more than a chemokines for eosinophil. It is said that Eotaxin selectively modulates fibroblast activities by increasing their proliferation, collagen synthesis and migration but not their differentiation into myofibroblasts or contractility in collagen gel[23]. What about Eotaxin modulate the bronchial smooth muscle cell migration and collagen synthesis? There is much to be further studied.

It is essential for fibronectin, collagen Iand CTGF to participate the increased extracellular matrix of airway[24]. According to these proteins, our study demonstrated that HBSMCs passively sensitized by asthmatic serum not only were more productive than controls, but also, they reacted more intense to the stimulator EGF. The results suggested that HBSMCs in asthma status possesed strong ability to secret multiple cytokines, growth factors and components of matrix. Fibronectin is essential for the development of OVA-induced airway fibrosis and airway hyperresponsiveness[25]. Connective tissue growth factor induces extracellular matrix in asthmatic airway smooth muscle[26]. Extracellular matrix also affects the growth of airway epithelial cells and fibroblasts in vitro and may influence epithelial thickness[27]. We propose the hypothesis that ECM and HBSMCs maybe establish a mutual vicious circle into the airway remodeling of chronic asthma.

MAPKs are critical for immune cell metabolism, migration, production of pro-inflammatory mediators, survival and differentiation. ERK1/2 signal plays an important role in the pathogenesis of asthma[4]. The role of ERK is few reported in the secretion of asthmatic HBSMCs. In this study, the results demonstrated that stimulation of ERK1/2 signaling pathway induced the higher secretion level of asthmatic HBSMCs and the inhibition of the pathway suppressed the process. This may suggest that ERK1/2 signaling pathway play an important role in secretion function of HBSMCs in asthma status. We also noted that there was a difference between the effect of PD98059 and that of antisense ODN in inhibition of the mRNA level of ERK1/2. The possible explain is that PD98059 is the inhibitor of ERK kinase (MEK), only capable of inhibiting the phosphorylation of ERK1/2, but not the transcription of ERK1/2.

In conclusion, this study demonstrates that ERK1/2 signalling pathway play an important role in regulation of the increased secretion of HBSMCs passively sensitized by asthmatic serum, and suggests that ERK1/2 antisense ODN is strong to inhibit the process.

Acknowledgement

This study was supported by a grant from National Natural Science Foundation of China (No. 30900648).

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Determining The Needs Of The Families That Have a Patient İn The Pediatric Intensive Care Unit And Analyzing Characteristics Of These Families

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Abstract

Introduction: In line with the view that accepts the patient and the family as a whole; good care of the families shall be taken throughout the recovery period. Meeting the needs of the family members besides the needs of the pediatric patient will improve the quality of the care in the nursing services.

Objective: The study is conducted with the objective of determining the needs of the families that have patients in the pediatric intensive care unit.

Material - Method: The universe of this cross-sectional study was composed of the families of patients that were in the Pediatric Intensive Care Unit of Samsun Ondokuz Mayıs University Research and Application Hospital on July 01, 2009-November 01, 2009. 200 patient relatives, who will represent 80% of the number of patients that stayed in hospital for the period of three months, were taken into the scope of the study. In data collection, family member description form and Scale for Determining Family Members' Needs were used. In the evaluation of the data, the data were analyzed in SPSS 10.0 package program and t test and variance analysis were conducted with descriptive statistics.

Result: When the first 3 important needs that the families who have patients in the intense care unit perceive and score averages were analyzed, being sure that the best care is given to their patients (3.99) takes the first place, receiving honest answers to their questions (3.96) takes the second place and receiving information about the state of the patient at least once a day (3.95) takes the third place. Insufficient notification of family members highlights the points about information need and these needs indicate the anxiety of patients. It was seen that gender, age, degree of relationship and the time spent in the intensive care unit don't affect the need score average of the family members. Moreover, it was determined that the need score averages of the family members are significantly different according to the educational backgrounds and intensive care units ($p<0.05$).

Conclusion: It was determined that seven out of the ten needs perceived as important by family members are information related needs and the remaining three are trust related needs. Intensive care nurses shall know the needs of the families and shall be able to meet them according to the order of priority. Such an approach will support both the patient and family in dealing with the disease.

Key words: Needs of the family, intensive care, family, Pediatric Intensive Care Unit

Introduction

Intensive care units are critical care units that aim to save lives and to discharge the patients by supporting the patients and families physically, mentally and socially (1). These units differentiate from other treatment units both in respect of instruments-equipments and the states of the patients being treated here. Moreover, the health professionals working here are facing more complication patient issues compared to other treatment units (2). Intensive care concept has a scary meaning both for the patients and patients' families (3).

Even though pediatric intensive care unit plays an important role in the treatment of children with critical diseases, it is also one of the medical environments that create crisis and traumatic stress

risk both in children and their parents (4). Although staying in the intensive care unit is a stress source both for the patient and the family, the patients experience deep anxieties about the state of health of their patients and the applied treatment (5, 6).

Being in the intensive care unit also causes families to start feeling anxiety as much as the patients (7). Especially in the pediatric intensive care units, there are various factors that may cause anxiety both in the patients and their families. The fact that the children cannot take care of themselves and need their parents and especially their mother for almost everything is among the main reasons of this anxiety (8-11).

Prioritizing life threatening situation in the intensive care units where critical care service is provided may cause the needs of the patients' families to be neglected or overlooked (12). Staying in the hospital or hospitalization is an important situation that has important impacts on the lives of the patient's family, not just the patient.

Hospital is a threat against the family integrity (8). Being in the hospital or intensive care unit has negative effects on the parents as much as the child, and causes theme to feel intensive stress and anxiety (11, 13 and 14). For their children to stay in the intensive care unit is a tough situation for the parents to handle.

Worrying that their children can die or become permanently disabled, questioning the performed procedures and applied treatments, feeling foreign to the hospital environment, seeing scary equipments that they don't know their purpose, feeling secondary in the care of their own children compared to the health professionals, feeling guilty because of the disease of their children, worrying about the other family members at home and financial concerns are some of the main problems that the families of the children staying in the intensive care unit mostly face (8, 9).

If they don't have solid information about the state of their child, the anxiety level may be much higher. In case of extreme anxiety, the perceptions of the parents may be damaged and there may be changes in the parenthood roles. Parents with high anxiety levels may have hard time participating to the care of their children and cooperating with the health team. And as a result of this, the development of the parent – children relationship that is supposed to be developed in the early ages may be delayed (8-11).

Most of the time the problems, concerns and needs of the relatives of the patients staying in the intensive care unit are disregarded (15). Issues such as the change in the parenthood role of the parent whose child is staying in the pediatric intensive care unit because of being separated from their child, the uncertainty about the child's future, the fear caused by now knowing how to take of the child at home, the lack of a waiting area in the intensive care unit and the lack of communication between the health care team and family members cause the stress experienced by the family members to increase even more (14).

In the study conducted by Ünver et al. (2003) to determine the needs of the families of the patients staying in the intensive care unit, the most important needs of the families were determined respectively as being sure that the best care is given to the patient and receiving honest answers to their questions (3).

Determining and meeting the needs of the family members or relatives of the patients staying in the intensive care unit positively affect the recovery period of these patients (6, 12 and 16). Thus it is required to determine and meet the needs of the families besides offering the life saving, high quality care and treatment service to the patient in the intensive care unit. Meeting the needs of the families is especially important in the pediatric intensive care units.

Basically the parents who have their children in the intensive care unit need true and reliable information, a person that will explain their children's state to them, and emotional, mental and physical support from someone else other than the personnel. Moreover creating the trust that their children are receiving the best possible care and giving them the chance to actively parenting their children are important in respect of the support provided to the family (14).

In supporting other family members in case one of the family members is accepted to stay in the hospital, the nurses are in a key position (8). In line with the view that accepts the patient and the family as a whole; good care of the families shall be taken throughout the recovery period of the patient (3).

For family members to be sure that their destroyed family balance is safe, they need acceptance, understanding, support and information from the hospital personnel. Intensive care nurses shall know that the families have some needs and shall be able to meet them according to the order of priority (3, 17).

The experience of staying in the pediatric intensive care unit that may negatively affect the relationship between the family and the child is a situation that needs evaluation also in respect of the family as much as the patient. In Turkey there is no sufficient number of studies about determining the needs of the families of the children staying in the pediatric intensive care unit.

Determining the needs of the families of the children staying in these units and meeting the needs of these families besides the patients' will help patients' relatives to trust the health team and the provided service by increasing the quality of the offered care and ensure the continuity of the relationship between the family and the child. Moreover, there will be a data resource about this subject in Turkey.

Objective

The goal of this study is to determine the needs of the families of the children staying in the pediatric intensive care unit and characteristics of these families.

Material & method

The universe of this cross- sectional study was composed of the families of patients that were in the Pediatric Intensive Care Unit of Samsun Ondokuz Mayıs University Research and Application Hospital on July 01, 2009 – November 01, 2009. 200 patient relatives, who will represent 80% of the number of patients that stayed in hospital for the period of three months, were taken into the scope of the study.

In the collection of the data, “Information Collecting Form” composed of 26 questions prepared by the researchers based on the literature to determine the socio-demographic characteristics of the parents that participated to the study, and "Critical Care Family Needs Inventory" were used.

The questionnaire was filled by a researcher and two pollsters by interviewing patients’ families in the hospital. Before the questionnaires were applied, the objective and subject of the research were told to the patients’ relatives that were taken into the scope of the study.

For the study to be conducted in the University hospital, a written permit of the hospital administration was taken before initiating the study. The data was collected between the 48th hour and 10th day following the babies to be accepted to the newborn intensive care unit. Within this period the mothers/fathers/relatives of the children staying in the hospital were informed adequately about the study and their oral consents about accepting to participate to the study were taken.

“Critical Care Family Needs Inventory” used to determine the needs of the family members was prepared by Molter in 1979. The inventory is composed of 46 items. Each article in the item is in four-choice Likert scaling type. A ranking from 1 to 4 was requested for each article.

According to this (1) means ‘not important’, (2) means ‘moderately important’, (3) means ‘important’ and (4) means ‘very important’. The inventory was translated by two academic member nurses. The inventory was applied to other 50 patient relatives before the study, and the Alpha value for the entire inventory was found as 0.82 in the conducted Cronbach Alpha analyses.

In the evaluation of the data, the descriptive information about the participants was given as figures and percentages. In the scale of determining the needs of the family members, the score were added by giving 1 to ‘not important’, 2 to ‘moderately important’, 3 to ‘important’ and 4 to ‘very important’ and the arithmetic means are obtained by dividing these totals to the number of samples.

Each item was ordered by score averages. All the statistical analyses of the study were conducted using the SPSS package program in the computer. In the evaluation of the data, the data were analyzed in SPSS 10.0 package program and t test and Variance analysis and Duncan test were conducted with descriptive statistics.

Results

The age average of the subjects that participated to the study was 32.98±8.41 (Minimum 15, Maximum 60). Table 1 shows the socio-demographic characteristics of the family members. According to Table 1, 44% of the participants were female and 56% were male. 39% of the participants were in the age group of 23-30, 63% of them were primary school graduates, 19% were high school graduates and %19 were university graduates. 48% of the family members were living in the city and 83% have social security.

Table 1. Socio-Demographic Characteristics of the Family Members

Socio-Demographic Characteristic	Number	%
Gender		
Female	88	44.0
Male	112	56.0
Age		
19-24	33	16.5
25-30	59	29.5
31-36	46	23.0
37-42	39	19.5
43 ≥	23	11.5
Educational Background		
Literate	4	2.0
Primary School	126	63.0
Secondary School	20	10.0
High School	38	19.0
University	12	19.0
Place of Residence		
City	96	48.0
County	50	25.0
Village	54	27.0
Social Security		
Yes	166	83.0
No	34	17.0

67% of the family members that participated to the study were mothers of the child, 26% were the fathers and 7% were the brothers, sisters and grandfathers. 74.5% of the patients were in the intensive care unit for 1-10 days, 17.5% were there for 11-20 days, 8.0% were there for 21-30 days or more.

It was determined that 78% of the children were staying in the intensive care unit for the first time and 46% of the families that have their children in the intensive care unit were informed about the intensive care unit (Table 2).

Table 2. Distribution of Some Properties about Family Members and Intensive Care

Properties	Number	%
Degree of Relationship		
Mother	134	67.0
Father	52	26.0
Other (Sister, brother, grandfather)	14	7.0
Length of Stay in the Intensive Care Unit		
1-10 days	149	74.5
11-20 days	35	17.5
21-30 days or more	16	8.0
History of Hospital Stay		
First stay	156	78.0
Second stay or longer history	44	22.0
Information about the intensive care unit and the patient		
Informed	94	47.0
Not informed	106	53.0
Total	200	100.0

Table 3 shows the average scores of the first ten needs that the family members that participated to the study stated as important. It was found that seven out of ten of these needs that the family members perceive as important were about information.

Table 3. The Score Averages of First 10 Needs Defined as Very Important by Family Members

Most Important Needs	X±Sd
1. Being sure that the patient receives the best care	3.99±9.97
2. Receiving honest answers to our questions	3.96±0.19
3. Receiving information about the state of the patient at least once a day	3.95±0.21
4. Feeling that there is hope	3.94±0.27
5. Knowing exactly what procedure is applied to the patient	3.92±0.30
6. Feeling that the hospital personnel are caring about the patient	3.91±0.32
7. Knowing how the patient will be treated medically	3.90±0.33
8. Notifying us about the patient transfer beforehand	3.88±0.32
9. Knowing the reasons behind the procedures, treatments, actions	3.86±0.34
10. Knowing the things that indicate improvement in the patient's condition	3.86±0.37

The information needs that family members state as important were respectively “Receiving honest answers to the question (3.96)”, “Receiving information about the state of the patient at least once a day (3.95)”, “Knowing exactly what procedure is applied to the patient (3.92)", "Knowing how the patient will be treated medically (3.90)", “Notifying us about the patient transfer beforehand (3.88)”, "Knowing the reasons behind the procedures, treatments, actions (3.86)" and "Knowing the things that indicate improvement in the patient's condition (3.86)".

And three of the ten needs that family members perceive as important were determined to be related with trust. These are “Being sure that the patient receives the best care (3.99)”, “Receiving honest answers to our questions (3.96)” and “Feeling that the hospital personnel are caring about the patient (3.91)”.

The first three needs that the family members perceive as the least important were determined as “Being able to bring a clergyman with me (2.06)”, “Having someone encouraging me to cry (2.47)" and "Finding a place that I can be alone in the hospital (2.61)". The first ten needs that family members perceive as least important were the ones related to support or comfort (Table 4).

Table 4. 10 Needs that Family Members Perceive as Least Important

Least Important Needs	X±Sd
1. Being able to bring a clergyman with me	2.06±1.02
2. Having someone encouraging me to cry	2.47±1.19
3. Finding a place that I can be alone in the hospital	2.61±1.07
4. Having someone that I can discuss my financial issues	2.62±1.09
5. Finding the foods I want in the hospital	2.72±1.03
6. Receiving information about the religious services in the hospital	2.73±1.15
7. Receiving information about people who may provide help about family issues in the hospital	2.74±0.97
8. Being able to stay alone when requested	2.82±1.00
9. Being able to have someone else visiting the patient together with me	2.85±0.92
10. Sharing my feelings with someone	2.94±1.00

The comparison of the score averages based on the socio-demographic characteristics of the family members is given in Table 5. The relationship between the need scores and genders of the family members were not found statistically significant ($p>0.05$).

The relationship between the need score averages and ages of the family members were not found statistically significant ($p>0.05$). And when the family need score averages were analyzed based on educational background, it was seen that as the education level increases the need score average decreases, however this relationship between educational background and family members' need score averages were not found statistically significant ($p>0.05$). And when the need score averages were analyzed in terms of their place of residence, it was seen that the need score increases as you go from urban areas toward rural areas (159.7±13.73). This difference between the need score averages based on the families’ places of residence was found statistically significant ($p<0.05$) (Table 5).

And when the need score average were examined in terms of families’ degree of relationship with the patient, the need score averages of fathers were found higher than the ones of mothers and other relatives (159.30±10.95).

The needs of the fathers of the children in the intensive care unit are more than the ones of other relatives and this difference in the need score based on degree of relationship was found statistically significant ($p<0.05$).

Moreover as the time the patient spends in the intensive care unit increases, the need scores of the family members increase, too. This difference between the need score averages of the family members based on the period the patient spends in the intensive care unit was found statistically significant ($p<0.05$) (Table 6).

The difference between need score averages of the family members according to the information level about the intensive care unit was not found statistically significant ($p>0.05$). The need score average of the parents whose children stay in the intensive care unit for the first time (157.07±13.96) was found to be higher than the one of the parents whose children stayed in this unit before. The difference between need scores based on the experience in intensive care unit was also found statistically significant ($p<0.05$) (Table 6).

Table 5. Comparison of the Need Score Averages Based on Socio-Demographic Characteristics of the Family Members

Properties	n	Average ± Standard Deviation	Statistics
Gender			
Female	88	155.65±15.85	*t=0.018
Male	112	155.69±12.78	p=0.985
Age			
19-24	33	157.78±11.77	
25-30	59	157.35±12.40	*F=1.838
31-36	46	153.30±14.09	P=0.123
37-42	39	151.92±16.36	
43 ≥	23	159.47±16.65	
Educational Background			
Literate	4	161.00 ± 3.46	
Primary School	126	156.90 ± 15.39	**F=1942
Secondary School	20	154.10 ± 16.42	P=0.105
High School	38	155.00 ± 8.17	
University	12	145.83 ± 10.62	
Place of Residence			
City	96	151.97±15.12	***F=6.759**
County	50	158.44±10.81	**P=0.001**
Village	54	159.7±13.73	
Total	200	155.68±14.18	

* *T= T test* ****F=One -Way ANOVA***

Table 6. Comparison of Need Score Averages Based on Properties of Family Members and Intensive Care

Intensive Care Properties	n	X±SD	Statistics
Degree of Relationship			
Mother	124	154.25±14.72	***F=3.124**
Father	62	159.30±10.95	**P=0.046**
Other (Sister, brother, grandfather)	14	152.28±19.18	
Length of Stay in the Intensive Care Unit			
1-10 days	132	155.92±14.49	***F=3.235**
10-20 days	47	152.34±12.39	**P=0.041**
21 days or more	21	161.61±14.43	
Status Information			
Informed	94	155.36±15.99	*F=0.089
Not informed	106	155.96±12.42	P=0.766
History of Intensive Care Unit Stay			
First stay	156	157.07±13.96	***F=2.663**
Second stay or longer history	44	150.72±13.99	**P=0.008**
Total	200	155.68±14.1818	

**F= One -Way ANOVA*

Discussion

It was determined that most of the family members that participated to the study was mothers (67%). The literature's statement about mothers being the first one among the family members that provide support to the children in the intensive care unit because of reasons such as the psychological bond between the child and the mother, child's dependence on the mother for a lot o thin-

gs, mother's primary role in the child care is in fact in line with this result of the study (18).

It was determined that most of the children of these families (74.5%) were staying in the intensive care unit for 1-10 days, and again this is the first time in intensive care unit for most of them (78%) and only 46% of the families were informed about the intensive care unit and their patients' state.

In a study (2009) that examines the 78 different studies conducted between the years of 1990-2008 about the needs of the families of the children staying in the neonatal intensive care units in different countries, it was determined that the most important need of the families were information and communication needs (19).

In the study conducted by Roden (2005), it was determined that family members cannot allocate enough time for their own needs and have communication problems with the healthcare personnel throughout the period they stay with their children in the hospital (20). And in another study conducted by Bond et al. (2003) on the families of intensive care patients suffering from traumatic brain injury, the information need, the need to receive information continuously and regularly, and the need to be informed in the care of the child took the first place (21).

In the study conducted by Ünver on families of the intensive care unit patients (2003) in Turkey, it was determined that the seven of the ten needs families perceive as most important are information needs. In the same study, the score average of the statements such as "receiving information at least once a day, providing the information in a language I can understand, notifying about the developments in the patient's status by calling home" are in the upper ranks (3).

In the study conducted by Çalışır et al. (2008) about the needs and anxiety levels of the parents of the babies in the newborn intensive care unit , it was determined that receiving information about the changes the state of health, diagnosis and treatment of the baby is the most important need. In the same study, it was determined that the family members mostly need to receive information about the changes and developments in the state of their children (10).

The results of the study are in line with the results of the studies conducted in Turkey and other countries about this subject. In our study, the information needs that family members state as important were respectively “Receiving honest answers to our questions (3.96)”, “Receiving information about the state of the patient at least once a day (3.95)”, “Knowing exactly what procedure is applied to the patient (3.92)", "Knowing how the patient will be treated medically (3.90)", “Notifying us about the patient transfer beforehand (3.88)”, "Knowing the reasons behind the procedures, treatments, actions (3.86)" and "Knowing the things that indicate improvement in the patient's condition (3.86)".

Family members to be informed insufficiently are among the reasons why the items about information need stand out. In the literature information need takes its place as the basic need defined by the patient relatives and it wad stated that the nurses have important roles in meeting this need (16).

The information related items to be at the forefront and most of the family members to be not informed in our study are in line with this information in the literature.

In a study conducted with 37 family members and 45 nurses in China, there were needs about the environmental planning among the priorities related with the needs of the families of the patients staying in the intensive unit besides information and trust (22). In the study conducted by Ünver on families of the intensive care unit patients (2003) in Turkey, it was determined that the two of the ten needs families perceive as most important are related to trust.

These were stated by family members as "being sure that the patient receives the best care" and "receiving honest answers to our questions" (3). And in our research, three of the ten needs that family members perceive as important were determined to be related with trust. And these were “Being sure that the patient receives the best care (3.99)”, “Receiving honest answers to our questions (an item that is also related with information need) (3.96)” and “Feeling that there is hope (3.94)” and “Feeling that the hospital personnel are caring about the patient (3.91)”.

These needs indicate the fear, insecurity and anxiety that the families experience. The findings in the other conducted studies also support the findings in our study.

Among the participants of the study, “the need to see the patient frequently” was in the twenty second place with the arithmetic mean of 3.59. The same need to be in the twenty third place in the

study of Ünver (2003) with the arithmetic average of 3.20 (3) supports the result of the study.

This result indicates that this need is not perceived as very important by the family members. The limited visitation periods in the intensive care unit have positive effects both on the patient and the patient relatives (24). Our study showed that the need to visit the patient frequently has less importance compared to the high importance rates of the need of knowing that the patient is good, the need of being sure that the patient receives good care, the need of trust and information.

This shows the importance of healthcare professional working in the intensive care unit to inform the family members adequately and ensure trust.

While the item of "feeling that there is hope" is in the eleventh place with the average score of 3.46 in the study of Ünver (2003) (3), it is in the first place among the most important ten needs in Molter's study (23) and in the fourth place in our study.

This difference may reflect the hopelessness feeling of the family relatives. However insufficiently informing the family members may take the items about information need to the top ranks and cause "feeling that there is hope" item to the low ranks. Moreover it may be thought that the concept of hope is a concept related with the previous state of health of the patient, the severity of the disease or its progress, and it may be related with the attitude and behavior of the healthcare personnel.

In the study, among the first ten needs that the relatives of the patients in the pediatric intensive care unit perceive as very important, "Being sure that the patient receives the best care" is in the first place and "Receiving honest answers to our questions" is in the second place.

The fact that "being sure that the patient receives the best care" is in the first place in the study of Uzun et al. (2002) (12) and in the third place in the study of Sucu et al. (2009) on relatives of the patient in the emergency service, support this study result. And Molter's study (23) to determine that families are worried about whether their patients receive a deliberate medical care or not causes to think that family relatives are insecure about the care given to the patient.

This result can be comprehended as the insufficient communication and information transfer between patient relatives and healthcare personnel.

The need of "receiving honest answers to our questions" is in the first place in the study conducted by Özgürsoy et al. (2008) on the relatives of the intensive care unit patients (26), in the second place in the study conducted by Lee et al. (2003) on the relatives of the intensive care unit patients (27), in the third place in the study of Tekinsoy (2005) on the accompanists of the intensive care patients (28) and in the fourth place in the study of Al-Hassan et al. (2004) about the perceived needs of the critical patients' families (29).

The fact that the needs involving the communication are stated as the most important ones in the studies conducted in the intensive care unit may cause to think that the families need to be sure that they receive honest answers to their question because of the fear, sadness and anxiety they experience for their patients in the intensive care unit.

Patients' families to receive answers to their questions may reduce their fears, stress and anxiety, and finding answer to their questions may cause them to feel safe besides feeling that their patients are at safe hands (16, 30 and 31).

According to the findings of the study, the ten needs that family members perceive as least important were the ones related to support or comfort. The fact that the family members to state support or comfort related needs as the least important ten needs in the study of Ünver (2003) support the findings of the study.

The obtained study findings are evaluated as while the family members try to reduce their stress and eliminate uncertainty in tough situation about their children, they don't care much about the issues about themselves.

In the studies of Özgürsoy et al. (2008) (26) that are in line with the study results of Mendonca et al. (1998) (32) and Freichels (1991), a statistically significant correlations couldn't be found between the need score averages of family members and the time spent in the intensive care unit ($p>0.05$). In the obtained study findings, a statistically significant difference was found when the need score averages of the family members were compared with the period that the patient stays in the intensive care unit ($p<0.05$). According to the findings, as the length of intensive care stay increases the need score increases, too.

Families perceived need such as being sure that the patient receives the best care (3.99), receiving

honest answers to our questions (3.96), and receiving information about the sate of the patient at least once a day (3.95) about the as most important in periods of 1-10 days, 11-20 days and 21 or more days.

It was found that families attaches great importance to their needs of information and trust, and neglect their needs about support and comfort in all these three periods. Since staying in the hospital for a longer period and family to be not informed in this period and communication issues will cause the concerns about the health state of the patient to increase incrementally, it may cause a significant difference among the need score averages of the family members according to the length of stay in the intensive care unit.

Based on the findings obtained from the study, the difference between the need score averages of the family members according to their degree of relationship was found to be statistically significant ($p<0.05$).

The needs of the fathers of the children staying in the intensive care unit are more than the needs of the other relatives. The reason behind the fact that the need score averages of fathers are higher than the mothers' may be the hard time the mothers have in defining their needs because of their high degrees of stress and anxiety, or father to feel greater anxiety about protecting his family because of his socially assigned role.

In the study of Özgürsoy et al. (2008), it was seen that age, gender, educational background don't affect the need score averages of the family members (26). And in the study, similarly no difference was found between the need score averages of the family members based on age, gender or educational background ($p>0.05$).

This indicates that the needs don't change according to the age, educational background and gender. However based on the findings obtained from the study, the difference between the need score averages of the family members according to their places of residence was found to be statistically significant ($p<0.05$). As they get closer to the rural regions, the need scores of the parents increase. This indicates the fact that the parents coming from rural areas need to receive more information.

Conclusion

The family members, who have children staying in the intensive care unit, experience stress and anxiety as much as the patients, and need support and care. The needs of the family members to be neglected increases this stress and anxiety even more.

It was determined that seven out of the ten needs perceived as important by family members are information related needs and the remaining three are trust related needs. Intensive care nurses shall know the needs of the families and shall be able to meet them according to the order of priority.

The nurse should always see the child and the family as a whole. Such an approach will encourage both the patient and family to deal with this health problem.

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Factors affecting efficiency of social security hospitals in Iran: Data Envelopment Analysis

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Abstract

Background: Existing hospitals in an obscure, complex environment with lots of factors affecting the manager's decision making process, and increasing cost of care in recent years confirm the importance of using appropriate techniques to evaluate hospital performance and factors affecting this index to increase hospital efficiency. For this reason, the technique used in this study is based on non-parametric data envelopment analysis. Increasing interest in using this method is because of the ability to rank efficient hospitals as compared to their inefficient counterparts.

Methods: This study examines the technical, managerial and scale efficiency of public hospitals affiliated to social security organization in Iran, between 2006-2008 by estimating a deterministic frontier production function and the variable return to scale (VRS), and input-oriented DEA model.

Results: The technical efficiency scores from this model showed that overall efficiency improved from 0.954 to 0.964, during the period of this study, implying that these hospitals have the potential of reducing 4% of their inputs with no impact on output levels. Also, the efficiency measurement derived from this method showed that the average scale efficiency was 95%.

The results from input slacks revealed that the number of personnel was more than the input target.

Conclusion: This study highlights the importance of using an appropriate strategy resource allocation and rationalizes their usage in order to improve hospital efficiency. Furthermore, one of the essential activities of a hospital manager is continuous evaluation of hospital performance and application of the proper technique for improving efficiency.

Key words: technical efficiency; scale efficiency; return to scale; Data Envelopment Analysis: DEA

Introduction

One of the important concerns in developing countries is the efficiency of using resources in health care sector. Hospitals as one of the important economic units of health care system, existing a complex environment with lots of factors that affect the managers' decision making and, also the scarcity of resources specially in health systems necessitate the use of scientific techniques in order to evaluate the performance of organization and allocate resources in a way that obtain optimum outputs. (1)

Also, growing cost of care in health systems, encounter them to a disastrous economical crisis and irreparable financial problems. It seems that because of vulnerable economic basis of the organizations in handling the fluctuations of money market, these problems would become more complex.

Hospitals as one of the most important economic units in health industry are encountered with lots of problems for competing peers and managing the growing pressure of government and social security institutions for decreasing prices and improving quality of services. So applying a proper technique to evaluate the performance of hospitals is inevitable. (2)

Efficiency as one of the most important techniques for assessing the performance of hospitals is in the focal point of managers specially health managers more than before, so efficiency has become an important criteria for hospital achievements. (3) Efficiency shows the success of a hospital in using its resources to produce output – obtaining maximal output for a given set of inputs. This can be assessed in terms of technical efficiency. (4)

Farrell in the year 1957 introduced a simple measure of firm efficiency. The way he defined technical efficiency developed the methods for estimating this type of efficiency. In the year1978, Data Envelopment Analysis (DEA) was introdu-

ced as one of the techniques for estimating technical efficiency. (5) DEA is a non-parametric linear programming method, measuring relative efficiencies for a group of similar units. It has some advantages over the old methods such as simple ratio and regression analysis. It is useful where there are multiple inputs and outputs in a unit such as hospital. (6-8)

This method was introduced as a superior method in the report by World Health Organization (WHO) in 2003 for measuring efficiency in health systems(9); therefore, the purpose of this project was to estimate technical, managerial and scale efficiency of 64 general hospitals affiliated to social security organization of Iran.

Materials and Methods

This cross sectional study that applied a variable return to scale, Input – oriented DEA model. Data for this research were obtained from the statistical center of social security organization for a total of 64 general hospitals in 2006-2008. Windeap software was used to analyze the data.

The input-oriented model, in particular, focuses on the minimization of inputs and calculates the degree to which each production unit can rapidly reduce the quantities of utilized inputs in order to still produce a given amount of outputs. Mathematically, the CRS input-oriented DEA model is formulated with the following non-linear fractional programming problem which, when solved, determines the Relative efficiency θ^*_{pp} of DMU ***p:***

$$\theta^*_{pp} = max \frac{\sum_{j=1}^{s} u_{jp} \cdot y_{jp}}{\sum_{i=1}^{m} v_{ip} \cdot x_{ip}}, \quad p \in \{1,2,\ldots n\}'$$

Subject to the following conditions:

$$\theta_{rp} = \frac{\sum_{j=1}^{s} u_{jp} \cdot y_{jr}}{\sum_{i=1}^{m} v_{ip} \cdot x_{ir}} \leq 1, \forall r = 1,2,\ldots,n$$

$$u_{jp} \geq \varepsilon > 0, v_{ip} \geq \varepsilon \forall i,j,p$$

In the above notation it is assumed that there are ***n*** DMUs and that each one ***p*** *(p=1,2,...,n)* is consuming varying quantities of ***m*** inputs $(x_{1p},x_{2p},\ldots,x_{mp})$ to produce varing quantities of **s** outputs $(y_{1p},y_{2p},\ldots,y_{sp})$. The multipliers u_{jp} and v_{ip} are the weights given by DMU ***p*** to jth outputs (y_{jr}) and to ith inputs (x_{ir}) of itself and every other DMU **r** ***(r=1,2,...p,...n).*** *(ε)* represents a small positive number defined to be smaller than any positive real number . The corresponding VRS input-oriented DEA model is formulated with following fractional programming problem:

$$\theta^*_{pp} = max \frac{\sum_{j=1}^{s} u_{jp} \cdot y_{jp} - u_{0p}}{\sum_{i=1}^{m} v_{ip} \cdot x_{ip}}, p \in \{1,2,\ldots n\}$$

Subject to the following conditions:

$$\theta_{rp} = \frac{\sum_{j=1}^{s} u_{jp} \cdot y_{jr} - u_{0p}}{\sum_{i=1}^{m} v_{ip} \cdot x_{ir}} \leq 1, \forall r = 1,2,\ldots,n$$

$$u_{jp} \geq \varepsilon > 0, v_{ip} \geq \varepsilon > 0, \quad \forall i,j,p$$

$$u_{0p} \in R$$

Therefore the VRS formulation ensures that each benchmark unit is comparable in size to the DMU being evaluated.

Regarding to other studies and also by the use of expert opinions, a manageable set of input and output variables were selected. These variables have the greatest impact on the efficiency of these hospitals. Input variables used in this study were the number of physician, nurses, other personnel and the number of fixed hospital beds. Moreover, four output variables including the number of inpatient admissions, the number of outpatient visits, the number of surgical operations, and bed occupancy rate were considered. These variables were also used for scale and managerial efficiency. As DEA is a non-parametric approach, it requires neither the use of a pre-specified functional form for technology nor distributional assumptions about error terms.

This study also identified the constant return to scale introduced as a full scale efficient hospital. Hospitals with full technical efficiency score were ranked by the weights they had in the reference set.

Results

Consideration of the efficiency is the most important and proper way of evaluating health system performance and also hospitals. Therefore, in recent years evaluating performance in this system and also economical units in the micro-level by the use of efficiency measurement has attracted the specialists' attention in the field of management economics and policy making.

The results are presented in Table ١ shows that during all the3 years of this study, 60% of under study hospitals were fully efficient in technical efficiency. This type of efficiency in each year was 0.954, 0.975, 0.964 respectively and the mean efficiency was 0.958. The range of efficiency within the efficient hospitals was from 0.997 to 0.711. In spite of the increasing trend that was shown in the mean technical efficiency of these hospitals during the period of study, the inputs of these hospitals could be used more efficiently by 4 percent during 2006-2008.

Table 1. Ranking the hospitals owned by social security organization with regard to technical efficiency with DEA model.

year / hospital	2006	2007	2008	Mean technical efficiency
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	1	1	1	1
10	1	1	1	1
11	1	1	1	1
12	1	1	1	1
13	1	1	1	1
14	1	1	1	1
15	1	1	1	1
16	1	1	1	1
17	1	1	1	1
18	1	1	1	1
19	1	1	1	1
20	1	1	1	1
21	1	1	1	1
22	1	1	1	1
23	1	1	1	1
24	1	1	1	1
25	1	1	1	1
26	1	1	0/992	0/997
27	1	0.989	1	0/996
28	1	1	0.986	0/995
29	1	0.986	1	0/995
30	1	0.995	0.998	0/994
31	0.979	1	1	0/993
32	0.977	1	1	0/992
33	1	1	0.966	0/998
34	0.960	1	1	0/986
35	0.949	1	1	0/983
36	1	1	0.939	0/979
37	1	0.940	0.992	0/977
38	1	1	0.917	0/972
39	0.914	1	0.994	0/969
40	1	0.900	1	0/966
41	1	1	0.893	0/964
42	1	0.925	0.950	0/958
43	1	0.956	0.920	0/958
44	1	0.915	0.944	0/958
45	0.950	0.947	0.961	0/952
46	0.849	1	0.973	0/940
47	0.954	0.955	0.898	0/935
48	0.956	1	0.850	0/935
49	0.921	1	0.862	0/927
50	0.772	1	1	0/927
51	0.867	0.906	1	0/924
52	1	0.943	0.822	0/921
53	0.960	0.879	0.913	0/917
54	0.855	0.926	0.968	0/916
55	0.879	0.941	0.901	0/907
56	0.904	0.848	0.956	0/902
57	0.880	0.900	0.913	0/897
58	0.915	0.865	0.885	0/888
59	0.837	0.854	0.904	0/865
60	0.813	0.785	1	0/866
61	0.798	0.814	0.892	0/834
62	0.755	0.827	0.867	0/816
63	0.705	0.605	0.984	0/764
64	0.722	0.701	0.711	0/711
mean	0.954	957.0	00/964	0.958

Table 2. Potential saving in inputs in the years 2006-2008

Year and input slacks												hospital
2008				2007				2006				
bed	personnel	nurse	physician	bed	personnel	nurse	physician	bed	personnel	nurse	physician	
-	-	-	-	-	-	-	-	-	-	-	-	1
-	17.55	10.30	-	-	15.52	8.82	-	-	52.12	26.70	-	2
-	-	-	-	-	-	-	-	-	-	-	-	3
-	30.31	4.334	-	-	-	-	-	-	-	-	-	4
5.48	29.66	-	-	-	41.63	-	15.89	-	-	-	-	5
-	-	-	-	-	87.53	50.68	9.43	-	-	-	-	6
-	-	-	-	-	-	-	-	-	-	-	-	7
-	-	-	-	-	-	-	-	-	-	-	-	8
-	-	-	-	-	-	-	-	-	-	-	-	9
-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	11
-	40.36	15.20	15.79	-	-	-	-	-	-	-	-	12
1.96	-	9.88	-	-	-	-	-	10.98	98.96	-	-	13
-	19.96	22.21	-	-	25.02	14.97	-	-	27.09	170.7	-	14
-	-	-	-	-	-	-	-	10.34	30.83	-	34.45	15
-	2.27	8.489	5.764	-	-	-	-	-	3.387	0.92	-	16
-	-	-	-	-	-	-	-	-	-	-	-	17
-	-	-	-	-	-	-	-	-	30.80	6.13	-	18
-	-	-	-	-	-	-	-	-	-	-	-	19
-	-	-	-	-	-	-	-	-	-	-	-	20
-	29.91	-	-	-	55.92	-	-	0.656	18.11	-	-	21
-	-	-	-	-	-	-	-	-	-	-	-	22
-	29.86	52.51	14.94	-	17.86	23.73	11.78	-	-	-	-	23
-	31.09	3.467	6.443	-	27.04	-	-	-	17.91	1.693	-	24
-	32.34	22.91	-	-	-	-	-	-	-	-	-	25
-	-	-	-	-	-	-	-	-	-		-	26
-	34.33	50.69	-	-	-	3.952	5.433	-	-	-	-	27
-	4.254	7.524	14.31	-	54.99	-	6.678	-	75.56	-	29.25	28
-	-	-	-	-	32.61	-	-	-	21.87	-	-	29
-	-	-	-	-	-	-	-	-	-	-	-	30
-	-	-	-	-	-	-	-	-	-	-	-	31
-	-	8.390	-	-	-	-	-	-	16.36	5.415	-	32
10.39	20.30	-	-	-	37.66		2.576	-	-	-	-	33
6.630	-	-	-	-	-	-	-	-	-	-	-	34
-	-	-	-	-	-	-	-	-	-	-	-	35
-	-	-	-	-	18.69	-	1.559	-	-	-	-	36
8.445	-	6.582	4.573	-	7.73	-	0.27	7.90	-	-	11.99	37
-	-	-	0.729	-	-	-	-	-	27.70	17.87	5.856	38
-	11.51	42.43	9.822	-	36.78	32.98	-	-	8.822	19.45	4.342	39
-	10.22	5.020	-	-	2.140	5.736	-	4.298	33.20	5.738	-	40
19.92	6.195	4.368	-	-	-	-	-	-	-	-	-	41
-	-	-	-	-	-	-	-	-	24.42	54.52	-	42
-	-	0.718	0.586	-	-	-	-	-	-	3.696	-	43
0.864	-	-	-	-	7.082	4.972	-	-	6.922	1.226	-	44

-	-	-	-	-	-	-	-	2.527	32.57	-	-	45
-	-	-	-	-	82.58	-	21.72	-	-	-	-	46
-	-	-	-	-	-	-	-	-	-	-	-	47
-	3.744	23.55	-	-	57.70	14.17	-	-	27.04	11.14	-	48
-	19.08	42.54	-	-	64.54	30.51	6.407	-	68.79	-	-	49
-	-	-	-	-	10.97	-	-	-	-	-	-	50
-	-	-	-	-	-	-	-	-	-	-	-	51
-	-	-	-	-	-	-	-	-	-	-	-	52
0.277	-	-	-	-	-	-	-	-	-	7.209	-	53
-	-	-	-	-	108.8	160.2	13.74	-	-	-	-	54
-	50.87	19.82	18.43	-	-	-	-	-	-	-	-	55
-	-	-	-	-	-	-	-	-	-	-	-	56
-	-	-	-	11.511	-	17.30	21.97	0.53	4.757	-	-	57
-	-	-	-	-	-	-	-	-	-	-	-	58
-	-	-	-	-	-	-	-	-	-	-	-	59
-	-	-	-	-	-	-	-	0.756	6.503	-	-	60
-	-	-	-	-	-	-	-	-	-	-	-	61
-	13.55	13.14	26.53	-	39.14	3.156	-	-	32.91	4.504	-	62
-	-	-	-	-	-	-	-	-	-	-	-	63
-	-	-	-		-	-	-	-	-	-	-	64
0.843	6.835	5.845	1.843	0.180	13.00	5.801	1.836	0.594	10.41	5.265	1.342	mean

Findings showed that in the first two years of the study, 60% and in last year (2007) 56% of hospitals were fully efficient in managerial efficiency and the average number of hospitals with complete managerial efficiency was reported to be 59%. The mean of pure technical efficiency in all 3 years of study was 0.953, 0.955, and 0.965, respectively which shows the increasing trend of this efficiency in the3 year period of this study. Moreover the total mean of pure technical efficiency score was 0.957.

The results from scale efficiency revealed that in the first year of the study, 30% and in the second and third years, 41% and 38% of the hospitals obtained complete scale efficiency scores (SE=1). Totally, the average number of fully efficient hospitals in this field was reported to be 36%. The means of scale efficiency in the 3 years were 0.959 , 0.940, and 0.966 respectively. The fluctuation which is seen in the mean scale efficiency did not indicate any trend in the way of improving efficiency in hospitals.

Overall, in the year 2006, 30% and in years 2006 and 2008, 37.5% were fully efficient in all 3 types of efficiency measured in this study. Moreover the findings of this study showed that 17% of the hospitals were functioning in the optimum scale (constant return to scale) and 25% of them had a decreasing return to scale (DRS).

In this study, input slacks are also defined in Table 2. The maximum slacks of the inputs were the number of other personnel in all the three years of this study and the minimum slacks were related to the number of the fixed hospital beds. It should be mentioned that in 36% of the hospitals during all the 3 years of this study, slacks in inputs had not been found.

Discussion

The scarcity of resources in health economics is the most important reason of paying attention to productivity and reasonable usage with maximum output in all units of health system. Hospitals, as one of the major and cost consuming units in health care system with lots of expensive technologies and allocation of 50-80 percent of the total health resources, still have inefficiency. Therefore taking appropriate measures for controlling and decreasing of wasting hospital resources for providing better and high qualified services is essential.(9)

As a result, application of a scientific technique in order to evaluate hospital performance and estimate efficiency and the factors affecting it, is one of the major affairs of health managers and health policy makers. This can make a major contribution to improve health services.(10)

Present study showed how one can measure the technical efficiency relative to best practice, using DEA. The results of this study demonstrated that score of technical, scale and pure technical efficiency, type of return to scale and input slacks in all general hospitals affiliated to social security organization, providing recommendations for enhancement of these efficiencies. Based on the results of measuring technical efficiency, in each year, %60 of these hospitals had full technical efficiency scores. Also, the mean score of this type of efficiency was 0.96. It should be mentioned that this study showed the increasing trend in technical efficiency from 95. in the first year to .96 in the last year.

Mazie in the year 2007 reported that with the same model the mean technical efficiency of Zambian hospitals was .67, and only %40 of these hospitals got complete score in this type of efficiency (11), compared with other studies, It seems that hospitals affiliated to social security organization have a good condition in this type of efficiency and inputs in these hospitals could be used more efficiently just by %4 during the study period.

Kontodimopoulos (2005) estimated the efficiency of 17 hospitals in Greece with DEA model, reporting that only 5 hospitals (/29) obtained the full technical efficiency score (12).Osei in the year 2005 indicated that 53% of 17 hospitals in Ghana had complete technical efficiency (13). In almost all these studies it is implied that inefficiency of organization management, location of hospitals and their unreasonable size had a great impact on the efficiency of hospitals.

Harrison (2004) indicated that, sometimes hospitals are located in an environment where demand for health care and hospital services is low; as a result hospitals' outputs such as inpatient admissions and outpatient visits reduce.

Therefore the results of using DEA model showed slacks in inputs and indicated that hospitals should reduce their operational costs, the number of personnel and also the number of beds and clinical services in order to reach to complete efficiency (14).

A study of the hospitals affiliated to social security organization in Iran conducted by Hatam (1994) showed that the reason of lacking technical efficiency was inappropriate usage of beds, nurses, physicians and other health care workers in these hospitals. By using a good strategy and high qualified manager, this limitation would be reduced (10).

Comparing these studies with the present one, it should be mentioned that fixed hospital beds in this study, have been used reasonably in comparison with other studies, but in the usage of personnel input, there are still some problem. These hospitals should conduct a proper plan for better employment of personnel. Scott (1993) recommended that increasing competition in hospitals, continuous fiscal controls by managers, and learning new managerial methods and knowledge in the field of health sciences can make a great contribution in hospitals' efficiency (15).

Copeland and Stone (1988) believe that, hospitals need to have a competition in applying the best manager and maintain this competition for increasing technical efficiency (16). Hospitals studied in this project, had a good condition in obtaining maximum efficiency and they should reduce their use of inputs just about 4% to reach the optimum efficiency. It seems that implication of appropriate and scientific managerial methods in employing the best inputs with optimum amount and also closing the inefficient wards of the hospitals can make a great contribution to an increase in the efficiency of hospitals.

The results of this study showed that 36% of the hospitals had complete scale efficiency and the average score of this type of efficiency was 95%. Ferrier (2005) and Byrnes (1994), reported the scale efficiency as 0.85 and /94, respectively.(17-18). In Osei's study (2002), 41/2% of the hospitals and 53% of the health care centers were reported to be fully scale efficient (13). The range of this type of efficiency was reported between (1- 0.79) in US in valmanis' study (1992) (19).

In another study done by Hatam (1999), the causes of scale efficiency were reported. She recommended that inefficiency in using hospitals' inputs such as beds as one of the important resources and also management inefficiency in applying financial resources are the reasons of scale inefficiency (10). Moreover the results obtained from Sherman's study (1984) were indicated the same reasons for scale inefficiency (20).

In the present study, although the score estimated for scale efficiency was /95(and it is more than the previous studies), the number of hospitals with

full scale efficiency score was minimum (36%). It seems that the trend of scale efficiency in general hospitals in this study is upward but to reach the optimum scale, having an accurate and precise health policy making, effective management, proper consumption of fixed hospital beds and reasonable establishment and development of hospitals to meet the public needs of the region are inevitable.

Daliri (2005) in Iran found that the mean pure technical efficiency was 0.95 (21). The obtained results of determining the pure technical efficiency of the hospitals under this study showed that 59% of the hospitals were fully efficient as to pure technical efficiency (mean= 0.95). In spite of the upward trend of this efficiency, it is still effective to have a better management and a proper allocation of human resource and other inputs for a better hospital performance. It should be mentioned that it is potentially possible to save resources using DEA analysis. The possibility of saving by proper utilization of inputs is presented in Table 2.

With regard to the input slacks, this study showed that the maximum potential for reducing inputs in order to increase the efficiency is for the number of other personnel (about 10%). This input slack in Junoy's study (2000) in Spain was 8/42% (22). The number of human resources slacks in Harrison's research was estimated 9.65. He recommended that human resources should be redistributed due to the potentialities facilities and regional needs, also education of personnel and prepares incentives in order to improve the level of professional personnel's skills cause better efficiency.

The results of most studies showed that due to the high costs allocated to human resources (60-80%), hospital managers should revise the policies in applying and employment of this expensive input to prevent high expenses.

In regard to the fixed bed slacks, the results were similar to those of the studies such as Junoy (2000) and Harrison (2004) The slacks of this input are reported as the least one (22/14). Harrison suggested that although the potential saving of this input is little, sometimes the existence of hospitals in regions with less demand for health care services and lack of access to hospital facilities by population can increase the slacks in beds (14). As a result, due to the high potential of saving in the number of personnel in the studied hospitals, it should be mentioned that regarding the confining governmental policy in allocation of resources, using "work study" and "time study" methods for better employment of personnel with regard to the hospital performance volume can contribute to increase inefficiency.

According to The results of this study, for improving efficiency in hospitals, development of quality and quantity of services, improvement of the financial resource absorption, and permanent evaluation of hospital performance are recommended. Also, health policy makers should evaluate the optimal allocation of beds and clinical services precisely. In order to ensure the accessibility of all services to all population. Because of

Using the key and the most important inputs in DEA estimation, this method provides an important information for managers and policy makers to construct new organizational planning for producing maximum outputs with the usage of minimum resources.

This paper is limited to the estimation of the scale, pure technical and technical efficiency. Allocative efficiency can be important too. Many factors such as size and type of the hospital, number of researches in hospitals, experience of the manager, etc. can also be significant in determining the efficiency.(23)

Due to uncontrollable factors (or pure statistical noise) that affects the performance of a unit, another limitation of this study is the application of just DEA nonparametric method. The use of parametric methods such as SFA (Stochastic Frontier Analysis) in estimating hospital efficiency is recommended.

Acknowledgment

The authors would like to thank Dr.Hosein Zare and Dr. Pouragha for their kind assistance and friendly guides. Also, we gratefully acknowledge all the managers in social security organization. This study was funded by Shiraz University of Medical Sciences with the number of 88-4697.

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The relationship between basal metabolic rate, lean body mass and femurs bone mineral density of national level basketball players of India

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Abstract

Aim: The aim of the study was to establish the relationship between basal metabolic rate (BMR) lean body mass (LBM) and bone mineral density (BMD) of four positions of femurs and total femur in in Indian national level basketball players.

Method: Thirty Indian national level basketball players (mean ± SD, age: 21 ± 1.71years, height: 182.33 ± 9.2 cm, weight: 75 ± 8.12 kg, BMI: 22.2 ± 3.12) participated in this study. All the participants in this study were Non-vegetarian. They all also were free of any illnesses such as diabetes, hyperthyroidism, hyperparathyroidism, cardiovascular disease and were not taking any medicine. The participants neither did report for using any antiseizure drugs, alcohol and Cortone consumption, nor smoking cigarette. The activity levels and dietary habits of all subjects were noted. BMD of the femurs was measured by Dual Energy X-Ray Absorptiometry (DEXA). We used Pearson correlation for measuring the correlation between BMD-BMR, BMR-LBM and BMD-LBM in national level basketball players. Significant level of test was at 0.05.

Results: BMR correlated significantly with BMD of the total femur, neck, troch, and shaft. These correlations were stronger in femur troch position. Also there was significance correlation between BMR- BMD, BMR - lean body mass (LBM), LBM-BMD of these players. But it should be noted that the relationship between BMD-LBM is more than the relationship of BMD-BMR.

Conclusions: BMR is closely associated with BMD in Indian national level basketball players. Also BMD have correlation with LBM in this group.

Key words: Basal metabolic rate, Bone mineral density, Femoral, Lean body mass and National level basketball players.

Introduction

The amount of bone gained during youth and the rate of loss later in life are important predictors for the risk of osteoporosis and fractures in life (1). Over the past two decades, there have been many studies which have shown that exercise can increase bone mass or density. The majority of these have relied on DEXA measures (2 and 3). Regular weight-bearing exercise, especially during the pre and after per pubertal years, leads to substantial benefits in BMC, BMD and skeletal structure, enhancing bone strength at loaded sites (4 and 5). However, few fragility fractures occur in youth, and only if the exercise induced skeletal benefits are retained into older age, a time when the incidence of fragility fractures rises exponentially, would these changes be of biological significance for fracture reduction (6 and 7). The limited data available indicate that exercise benefits in BMC and BMD are eroded in the long term. In contrast, several studies suggest that exercise-induced structural changes may be retained even following the cessation of exercise (3, 5 and 8).

However, it is uncertain what actually happens to the fracture risk of individuals who retire from exercise and reduce their level of activity to that of the average individual. Recent retrospective observational and case-control studies suggest that there could be a reduced fracture risk in former athletes. Each of these traits could be maintained in former athletes after their active career, and may help to reduce the number of fractures later in life. Therefore, based on the current evidence, we recommend a physically active lifestyle youth as a possible preventive strategy against fragility fractures in old age (9, 10 and 11).

BMR is defined as the minimum energy needed to maintain vital functions. In addition to this,

40 percentage of BMR is used by the central nervous system, and 20 to 30 percentage of BMR is used by skeletal muscle (12). A study that included 345 postmenopausal women and 224 elderly men (55–69 years) reported a significant correlation between BMR and BMD. In the SCI population, linear relationship between physical activity and BMD or BMR is known (13).

For some years scientists have been interested in identifying the relationship of BMR to help the BMD. With the public's increased awareness of the general health benefits of aerobic training, research has focused on the relationship of aerobic fitness to Resting Metabolic Rate (RMR), BMR and BMD (14). This relationship can be investigated either longitudinally, by observing the responses of an untrained group of subjects to a period of training, or cross-sectional, by observing the relationship between maximal oxygen consumption (VO2max) and RMR, BMR and BMD in subjects (14 and 15). There are also some studies on the relationship of body mass index (BMI) and body fat percentage with BMD on postmenopausal women and some papal have a problem in bodies (6, 13, 16 and 17). Few studies have closely examined relationships between BMD and BMR in range of 18 to 30 subjects. In the present study, we investigated the associations of BMR, LBM and femurs BMD of national level Indian basketball players.

Materials and Methods

In this study, 30 Indian National level basketball players (with mean+/-SD, age 21±1.71years, height: 182.33 ±9.2 cm, weight: 75±8.12 kg, BMI: 22.2 ± 3.12) participated. All the participants were the members of basketball teams in first league of India. The selections of the participants were done through simple random sampling.

At the first stage the participants were given some information about the goal and different stages of data collection and then they filled a testimonial of participation in the research. Participants had no bone tear, bone hollow in family records and diseases such as diabetes, hyperthyroidism, hyperparathyroidism, cardio-respiratory diseases and they were not using alcohol, cigarette, anti- respiratory medicines and Cortone. Players have regular exercise of basketball for more than six years and they have six session's trainings in a week regularly. They were members of a team and regularly trained under supervision of the trainer. All the subjects in this study have Non-vegetarian diets. We used one questionnaire in this study. The questionnaire was divided into two parts. The first part consisted of personal information of players (such as age, length, weight, etc.) and the second part evaluated medical information (such as bone tear, not using smoke, alcohol, medicine, etc.). BMD of subjects was calculated by DEXA machine in Sir Sunderlal hospital of BHU in Varanasi. In this method the base of mass measurement was using two high and low energy sources which make different absorption from soft and bony tissues. For determining the Body Fat Mass and Low Body Fat Mass we used the DEXA machine also. For calculation of the BMR we used the formula.

Table 1. Amount of some anthropometric parameters, BMR and BMD in Indian national level basketball players

Variable	Mean
Age(years)	21±1.71
Weight(kg)	75±8.12
Height(cm)	182.33 ±9.2
BMI(kg/m2)	22.2 ± 3.12
Body Fat(kg)	11.52± 3.2
Body fat percentage	15.27± 3.17
Lean body fat(kg)	63.42± 4.21
BMI	22.2±3.12±81
BMR	1726.21±72
Femur Neck	1.195
Femur Wards	1.091
Femur Troch	1.074
Femur Shaft	1.247
Total Femur	1.1494

Statistical Procedures

SPSS was used to analyze data and data were analyzed through descriptive and deductive statistics. In descriptive statistics, indexes such as average, standard division, frequency table related to age, length, weight, etc. were used. In deductive statistics, we used Pearson correlation for measuring the correlation between BMD-BMR, BMR-LBM and BMD-LBM in national level basketball players. Significant level of test was at 0.05.

Results

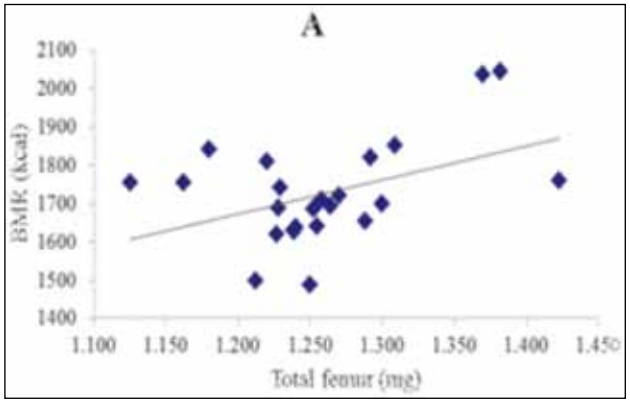
BMR correlated significantly with BMD of the total femur, neck, troch, and shaft. These correlations were stronger in femur troch position. Also there was significance correlation between BMR-BMD and BMR-LBM (Table2). In this study, we investigated the relationship between LBM and four positions of femur BMD values in Indian national level basketball players.

*Table 2. Pearson correlations among four positions of femur BMD and LBM with BMR (*P≤.05)*

Variable	N	Pearson Correlation with BMR	Sig. (2-tailed)
Femur Neck	30	.408	.048*
Femur Wards	30	.438	.032*
Femur Troch	30	.504	.012*
Femur Shaft	30	.417	.042*
Total Femur	30	.434	.033*
Lean body mass	30	.807	.015*

*Table 3. Pearson correlations among LBM with four positions of femurs BMD (*P≤.05)*

Variable	N	Pearson Correlation with lean body mass	Sig. (2-tailed)
Femur Neck	30	.740	.015*
Femur Wards	30	.591	.041*
Femur Troch	30	.680	.039*
Femur Shaft	30	.830	.009*
Total Femur	30	.770	.025*



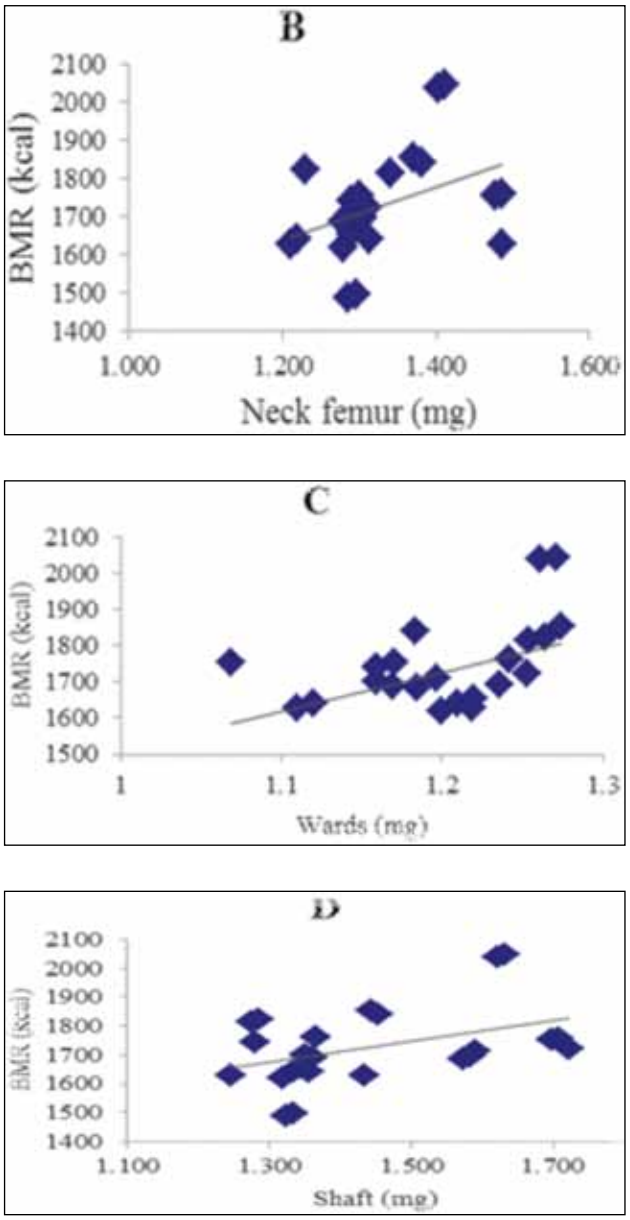


Figure 1. Scatter plots that show the correlation between BMR and four positions of femur BMD (A, B, C and D).

Discussion

In this study, we investigated the relationship between BMR and total femur, neck, wards, troch, and shaft BMD. These two variables have positive correlation. This finding was consistent with the previous literature (6, 13, 16, 17 and 18). On the other hand, our results show that there is a positive correlation between BMR and four positions of femur BMD in Indian national level basketball players.

In this study we found that BMD is more strongly correlated with LBM than BMR. Our results are in accordance with previous studies (6, 13, 16,

19 and20). They reported that BMD is more closely related to LBM, but in some studies BMD have more correlation with BMR than LBM, for example Ijuin2002 reported that BMD of lumbar spine and pelvis correlated with body fat mass but not with LBM in postmenopausal women (21). Also these studies were done on old men and women. Furthermore, the mean values of lean body mass were significantly lower in old men and women.

Also Subject populations, nutritional status, or anthropometric measurement methods may have differed among the studies.

It is known that resting energy expenditure correlates strongly with spine, total femoral and total body bone mineral content and BMD in postmenopausal women and old men populations. According to our knowledge, this is one of the first studies examining the association between femur BMD and BMR in national level athletes (22 and 23).

In some studies it is shown that, in older men and women, the increase in BMR will cause the increase in the BMD and prevent the osteoporosis (13and 20).

Interestingly, the present study describes that BMR and LBM correlate more strongly with bone density in national level basketball players. Measurements of BMR might be of value in assessing the impairment of BMD. Because in this study we did not investigate some blood variable which affect the BMD or metabolic parameters or a long history of dietary habits, we could not ascertain why BMR correlated closely with BMD, and whether higher BMR was causative or resultant of elevated BMD. But there are some studies which show the effect of weight bearing activity (i.e. Basketball) on the increase of BMR. These activities have very strong positive relationship on the increase of BMD. According to our findings we can confess that increase in BMR and LBM will led to increase of BMD; because both BMR and LBM variable have the positive and significant relationship with femurs BMD. But we stress that the findings of the current study can be of limited significance in respect that some factors might have affected the study's results.

Conclusion

There is a strong correlation between four positions of femur BMD and BMR in national level basketball players. In this study we also find that LBM and femur BMD have a close correlation with each other.

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Behaviors of students towards safety measures to prevent school accidents

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Abstract

Objectives: This study examined accidents at school among 6th, 7th and 8th grade students and their behaviors towards safety measures taken to prevent these accidents.

Methods: The study included a sample of 243 6th, 7th and 8th grade students attending Zafer Primary School, İnönü Primary School, Kurtuluş Primary School, Atatürk Primary School and Tevfik İleri Primary School in Ankara, Turkey. A 40-item survey was used to determine the behaviors of students towards safety measures taken to prevent school accidents.

Results: It was found that 38.7% of students had experienced at least one school accident during the previous year, the great majority of which (79.8%) involved falls. The behaviors of students towards safety measures to prevent school accidents vary according to gender and whether the students had previously experienced an accident; behaviors in terms of accident prevention measures were more positive among students who had been in an accident during the previous year.

Conclusion*:* It was necessary that, take adequate precautions to protect primary education students from school accidents and to regularly check the application of these measures

Key words: Primary education students, school accident, safety measure

Introduction

Accidents have a considerable impact on children's health. Accidents upset the balance of children by affecting their health physically, psychologically and socially. Accidents may lead to diseases, disabilities and even deaths, and place a heavy financial burden on family and society. Accidents, which are a result of misbehavior and neglect, are incidents that people can avoid and protect themselves from[1].

In comparison to other injuries, child injuries child injuries are common in countries like Turkey, which have a young population[2]. Students in grades 6,7 and 8 are more frequently exposed to accidents during games and sports activities[3]. Incidents such as abrasion, dislocation, sprain, wound, bruise, ecchymosis, electric shock, poisoning, drowning, burns, and even death may occur as a result of such accidents. Following accidents, students may be unable to attend school, or to temporarily or permanently fulfill various functions[4] .

Lack of student supervision by teachers, failure to control students in corridors and classrooms during breaks, and reckless behaviors while entering or leaving classrooms may cause injuries. In addition, misuse of electrical materials at school and lack of warnings and precautions about the use of these materials may also create certain dangers[5].

Most student behaviors during the school day are observable and controllable behaviors. Therefore, information can be collected about accidents occurring within the school environment, and risks can be managed through potential protection measures. In this respect, school accidents differ from other types of childhood injuries[6]. Prevention of school accidents that occur as a result of various factors is an important topic. All efforts to prevent school accidents require collecting information about the space, time and frequency of these accidents[3].

Personal protection measures that are implemented to prevent school accidents aim to enable children to adopt safe behaviors. To this end, such interventions can be made in every environment where the child is present. As these interventions aim to create a behavioral change, they should be long-term and they should be effective enough to achieve a behavioral change[7]. Therefore, this

study was planned and conducted in order to examine the behaviors of primary education 6th, 7th and 8th grade students concerning safety measures used to prevent school accidents.

Methods

The study examined whether students had been involved in an accident in the previous year, accident characteristics, and their behaviors towards safety measures adopted to prevent these accidents. The study universe comprised students attending primary schools in Ankara Province, Turkey. Cluster sampling was employed, taking five primary schools in Ankara as clusters. A total of 243 students attending 6th, 7th and 8th grades formed the study sample. Participating students attended Zafer Primary School (n=51), İnönü Primary School (n=30), Kurtuluş Primary School (n=52), Atatürk Primary School (n= 46), and Tevfik İleri Primary School (n=64).

A two-part survey was used for data collection. The first part of the survey examined demographic characteristics of students, accident status and accident characteristics (frequency accident, season, day, the space in which the accident occurred, cause of the accident, injury status, application place, accident type and outcome). The second part involves a 40-item questionnaire on students' behaviors towards safety measures implemented to prevent school accidents[1].

The 40 questionnaire items used a 5-point Likert-type scale. Accordingly, the 23 positive items in the scale were graded as "Never=1", "Rarely=2", "Sometimes/Occasionally=3", "Mostly/Usually=4" and "Always=5"; and the 17 negative items were graded as "Always=1", "Mostly/Usually=2", "Sometimes/Occasionally=3", "Rarely=4", and "Never=5".

Data were analyzed via SPSS 14.01, and students' accident status and the distribution of accident characteristics were given by frequency and percentage values. Participants' perceptions of each questionnaire item were described by arithmetic mean and standard deviation values as well as frequency and percentage distribution. The mean of the items making up the scale was calculated by reverse-grading the negative items in the above-mentioned grading system. The t test (for two groups) and analysis of variance (for three or more groups) were employed for comparison of average scores from the behavior scale, according to students' characteristics. The Tukey test was used for paired comparison of groups in analysis of variance.

In the present study, confirmatory factor analysis was used to analyze questionnaire responses. It was found that the scale was collected under 4 factors with Eigenvalues higher than 1, expressing 72% of the total variance. The Bartlett test indicated that factor analysis is applicable (χ^2=2724.6; p<0.001). In addition, the calculated Kaiser-Meyer-Olkin value (KMO=0.812) demonstrated that sample size was sufficiently large. Cronbach's Alpha values of the reliability of the scale were 0.813 for the first factor (unsafe behaviors, comprising 15 items), 0.795 for the second factor (indoor safe behaviors, comprising 13 items), 0.762 for the third factor (outdoor safe behaviors, comprising 9 items), and 0.853 for the fourth factor (behaviors while riding the school shuttle, comprising 3 items). Cronbach's Alpha value was 0.826 for the whole scale comprising a total of 40 items. Gür and Yıldız (2009) also determined 4 factors for this scale they developed, and they found an overall Cronbach's Alpha value for the scale of 0.810.

Results

Results on Personal and Accident Characteristics of Students

The results showed that 54.7 % (f=133) of study participants are female and 45.3 % (f=110) are male; 11.9 % are in the 6th grade (f=29), 57.2 % (f=139) in the 7th grade, and 30.8 % (f=75) in the 8th grade. Of students' fathers, 26.7 % (f=65) have an educational level of primary school or lower, 24.7 % (f=60) have a secondary school an education, 27.2 % (f=66) have a high school education, and 21.3 % (f=52) have a university education. Of students' mothers, 44.9 % (f=109) have an educational level of primary school or lower, 21 % (f=51) have a secondary school education, 23 % (f=56) have a high school education, and 11.1 % (f=27) have a university education. Of students included in the present study, 24.3 % (f=59) have a monthly family income of 750 TL or less, 48.1 % (f=117) have a monthly family income of 751-1500 TL, and 27.6 % (f=67) have a monthly family income of 1501 TL and higher.

Table 1. Distribution of students according to accident status and accident characteristics

Variable	Group	f	%	Variable	Group	f	%
Accident Status	Yes	94	38.7	Cause of Accident N:94	Recklessness	42	44.7
	No	149	61.3		Bantering	14	14.9
Frequency of Having Accident N:94	Once	73	77.7		Pushing and fighting	15	15.9
	Twice	14	14.9		Running	8	8.6
	3 times and more	7	7.4		Others (stairs, slippery ground etc..)	15	15.9
Season of Accident N:94	Spring	29	30.8	Injury Type N:94	Fracture	5	5.3
	Summer	23	24.5		Dislocation	5	5.3
	Autumn	15	16.0		Injury	25	26.6
	Winter	27	28.7		Cut - Contusion	19	20.2
Day of Accident N:94	Monday	11	11.7		Bruising - swelling	21	22.4
	Tuesday	28	29.8		Others (abrasion, split etc.)	19	20.2
	Wednesday	26	27.6	Application Place N:94	Nowhere	52	55.3
	Thursday	17	18.1		Hospital	28	29.8
	Friday	12	12.8		School's doctor	7	7.4
Accident Location N:94	Classroom	30	31.9		Teacher	7	7.4
	Garden	28	29.8	Outcome of Accident N:94	Complete recovery	85	90.4
	Corridor	18	19.1		Temporary disability	7	7.5
	Stairs	10	10.6		Permanent disability	2	2.1
	Other (toilet, gymnasium etc.)	8	8.6	Type of Accident N:94	Fall	75	79.8
					Cut	16	17.0
					Others (poisoning, burn, drowning etc.)	3	3.2

Findings about students' accident status within the previous year and accident characteristics are presented in Table 1.

According to the findings in Table 1, of students forming the sample, 38.7 % (f=94) stated that they had at least one school accident during the previous year, 61.3 % (f=149) stated that they had not had any school accident. Of the students having a school accident, 77.7 % had one accident, 14.9 % had two accidents, and 7.4 % had three accidents.

The distribution in Table 1 shows that there are higher proportions of school accidents during spring and winter seasons and on Tuesday and Wednesday in comparison to other times. Most accidents occurred within the classroom (31.9%) and in the garden (29.8%). A considerable proportion of accidents (44.7%) occurred as a result of restlessness.

Examining the distribution of accidents types, it is seen that a great majority of accidents at school (79.8%) involved a fall, 26.6 % of accidents resulted in an injury, 22.4 % resulted in bruising – swelling, and 55.3 % of students did not seek assistance or treatment after the accident. It was determined that 90.4 % of students recovered completely, 7.4 % had temporary disabilities, and 2.1 % had permanent disabilities (Table 1).

Student Behaviors Towards Safety Measures to Prevent School Accidents

Descriptive/introductory statistics concerning the behaviors of students towards safety measures to prevent school accidents are presented in Table 2.

According to the findings in Table 2, the most negative behavior within the unsafe behaviors factor is "skiing in the school garden when it snows" ($\bar{X}$ =3.09). For this item, 25.10 % of students responded 'Always', 16.46 % responded 'Usually', 16.46 % responded 'Sometimes', 8.23 % responded 'Rarely', and 33.74 % responded 'Never'. Examining arithmetic mean values, it is seen that other negative behaviors of students within the unsafe behaviors factor are related to "use of the school garden when there is a density of vehicles in the garden" ($\bar{X}$=3.44) and "going into the school running" ($\bar{X}$=3.46). The

Table 2. Descriptive statistics concerning behaviors of students towards safety measures to prevent school accidents (n=243)

Factors	Item no.	Items/Expressions/Judgments	Always	Usually	/ Sometimes	Rarely	Never	$\bar{X}$	s.d.
			%	%	%	%	%		
Unsafe Behaviors	1	I go into the school running	11.93	10.70	26.34	21.40	29.63	3.46	1.33
	2	I go out of the school running	11.52	11.11	21.81	18.93	36.63	3.58	1.38
	3	I go up the stairs running	9.88	15.64	19.75	21.81	32.92	3.52	1.35
	4	I go down the stairs running	12.35	10.29	20.58	19.75	37.04	3.59	1.39
	5	I try to enter locked places such as roof outlets and storage rooms as I get curious about these places	14.40	8.64	13.99	10.29	52.67	3.78	1.51
	6	I hang out of open windows	14.81	14.81	6.58	9.47	54.32	3.74	1.57
	7	I turn the corners of the school building fast	18.93	12.76	16.46	14.81	37.04	3.38	1.54
	8	When I have sharp-edged materials in my hand (pencil, scissors etc.), I joke with my friends	13.58	7.82	10.29	10.70	57.61	3.91	1.49
	9	My friends and I hustle	14.81	10.70	19.34	16.05	39.09	3.54	1.46
	10	I deal with plugs and broken electrical devices or those with stripped cables	11.52	10.70	5.35	9.05	63.37	4.02	1.47
	11	I enter the laboratory with food and beverage in my hand	16.87	8.23	9.05	11.93	53.91	3.79	1.56
	12	When it snows, I ski in the school garden	25.10	16.46	16.46	8.23	33.74	3.09	1.61
	13	I walk on the walls surrounding the school garden	16.05	17.28	9.05	9.05	48.56	3.57	1.59
	14	I leap over the walls surrounding the school garden	17.28	14.40	5.76	7.41	55.14	3.69	1.63
	15	I use the school garden when there are vehicles in the garden (shuttles or other cars)	20.16	12.35	12.35	13.58	41.56	3.44	1.60
Indoor Safe Behaviors	16	I take care of materials likely to cause accident in the corridor (Fire equipment, cabinet etc.)	64.20	14.40	7.00	3.70	10.70	4.18	1.34
	17	I switch on the light if the area I am in is not well illuminated	60.08	15.23	16.05	4.12	4.53	4.22	1.14
	18	I behave more carefully in the classroom area where hangers are situated.	59.67	16.87	13.17	5.76	4.53	4.21	1.15
	19	I check the soundness of sharp-edged materials before using them.	62.96	15.64	11.11	4.94	5.35	4.26	1.17
	20	I learn the proper usage of sharp-edged materials which I will use for the first time	60.49	17.70	12.35	3.29	6.17	4.23	1.17
	21	I prefer to use blunt scissors	40.33	19.34	17.70	6.17	16.46	3.61	1.47
	22	When I have sharp-edged materials in my hand (pencil, scissors etc.), I take care for not pricking them	64.61	20.16	6.58	2.88	5.76	4.35	1.11
	23	When I have sharp-edged materials in my hand (pencil, scissors etc.), I do not turn the point of them towards the person with me	64.61	11.11	7.82	2.47	13.99	4.10	1.44
	24	I read the effects of chemical substances in the laboratories	48.56	20.16	13.17	3.70	14.40	3.85	1.43
	25	I use the chemical substances under the control of a teacher	59.26	16.46	13.58	4.12	6.58	4.18	1.21
	26	I work under the control of a teacher in rooms such as laboratory and craft room	60.08	13.58	13.58	6.17	6.58	4.14	1.25
	27	I read usage rules and warning signs of craft rooms	62.14	14.40	9.88	5.76	7.82	4.17	1.28

Outdoor safe Behaviors	28	I obey the rules of games when playing in the garden	61.73	19.75	7.00	4.12	7.41	4.24	1.21
	29	I put on knee guard and wrist supporter during sports activities	33.33	16.46	11.52	10.29	28.40	3.16	1.65
	30	I limber up before sports activities	60.91	18.11	11.11	5.35	4.53	4.26	1.13
	31	I check the soundness of materials before games	53.50	15.64	14.81	7.82	8.23	3.98	1.32
	32	When it snows, I walk more carefully so as not to fall	73.25	16.46	4.53	1.23	4.53	4.53	.98
	33	I take into consideration warning signs in dangerous areas in the garden	57.61	16.87	13.58	4.94	7.00	4.13	1.24
	34	I warn my teachers for improvement of places in need of reparation inside and outside the building	38.27	11.11	24.69	10.70	15.23	3.47	1.47
	35	I firstly look right, then left, and then right again while going out of the gate of the school	43.62	16.05	16.05	10.29	13.99	3.65	1.47
	36	I use the right side while going up the stairs	38.68	17.70	20.58	12.76	10.29	3.62	1.37
	37	I try to be careful when walking on wet and slippery grounds	64.61	15.23	11.11	4.53	4.53	4.31	1.12
Shuttles	38	I hang my hands/arms out of the windows when shuttles are in motion	9.05	2.88	3.70	2.47	33.74	3.94	1.59
	39	I remain standing when the shuttle is in motion	7.00	4.94	7.82	7.00	25.51	3.75	1.47
	40	I am calm and controlled when I am going in or out of the shuttles	31.28	8.64	4.53	2.88	4.94	4.12	1.33

most positive behavior of students within this factor is in response to the item "dealing with plugs and broken electrical devices or those with stripped cables" ($\bar{X}$=4.02), where 63.37 % of students gave the answer 'Never'.

Within the "indoor safe behaviors" factor, the most negative behaviors among primary students, in comparison to other behaviors, were in relation to "preferring to use blunt scissors" ($\bar{X}$=3.61) and "reading the effects of chemical substances in laboratories" ($\bar{X}$=3.85). Within this factor, the most positive behavior was expressed in relation to "taking care no to prick them when carrying sharp-edged (pencil, scissors etc.)" ($\bar{X}$=4.35). The most negative behavior of students within the outdoor safe behaviors factor is about "putting on knee guards and wrist supports during sports activities" ($\bar{X}$=3.16). The most positive behavior in outdoor safe behaviors factor is about "walking more carefully so as not to fall when it snows" ($\bar{X}$=4.53). The most negative behavior within the school shuttle factor is about "remaining standing when the shuttle is in motion" ($\bar{X}$=3.75) (Table 2).

T test comparisons of students according to their knowledge of safety measures to prevent school accidents, their accident status and gender (determined to have a significant/important relationship) are presented in Table 3.

According to the analysis shown in Table 3, student behaviors towards safety measures to prevent school accidents vary according to accident status and gender ($p<0.01$). However, no significant relationship was found between student behaviors and school, grade, father's educational level, mother's educational level or monthly family income ($p>0.05$). Examining the average values given

Table 3. Comparison of student behaviors towards safety measures to prevent school accidents according accident status and gender

Variable	Group	N	$\bar{X}$	s.d.	t	p
Accident Status	Yes	94	3.634	0.495	8.210	0.000*
	No	149	4.231	0.632		
Gender	Female	133	4.029	0.582	4.163	0.000*
	Male	110	3.673	0.723		

*$p<.001$

in Table 3, the behaviors of students who had at least one accident within the previous year ($\overline{X}$=3.634) are more negative in comparison to those of students who did not have any accident during this time period ($\overline{X}$=4.231). In addition, the averages in Table 3 demonstrate that behaviors of female students towards accident prevention measures ($\overline{X}$=4.029) are more positive compared to those of male students ($\overline{X}$=3.673).

Discussion

Accidents frequently occur at schools, as students use these sites intensively and for long periods[4]. According to the results of the present study, 38.7 % of students experienced at least an accident within the previous year. Ergüder (2004) stated that 59.8 % of students experienced an accident while at school, compared with 41.2 % reported by Eraslan (2007), 3.8% reported by Menchel and Laffamme, and 9.8% reported by Boyce et al. (1984)[3,4,8,9].

Of students having an accident, Erarslan's study reported that 77.7 % had a school accident once and 14.9 % had school accidents twice. In previous studies, 68.6 % of students in Erarslan's study and 85.2 % of students in Ergüder's study had at least one school accident[3,4].

The proportion of students having an accident in spring is higher compared to other seasons. This may result from the increase in number of outdoor games and activities when the temperature starts to rise.

According to the present study, school accidents mostly occur within the classroom (31.9 %) and in the school garden (29.8 %). A considerable proportion (44.7 %) of accidents occur due to recklessness. In the study by Ergüder (2004), most accidents occurred in the school garden (59.3 %), then in the classroom (26.0 %), and then on stairs (14.9 %).[4] In the study by Feldman et al. (1983), the percentage of those who had an accident in the gymnasium is higher.[10] However, in Sosnowska and Kostka (2003), Maitra (1997) and Sheps and Evans (1987), most accidents occurred in the playground[11-13]. Boyce et al. (1984) reported that the lowest proportion of accidents occurred in the classroom.[9] These differences may result from arrangements made to prevent accidents in the school surroundings and in the classrooms. In order to prevent accidents, necessary arrangements should be made, particularly in classrooms, which is where the highest proportion of accidents is experienced.

A great majority of students in the present study (79.8 %) had an accident as a result of a fall. Di Scala et al. (1997) and Maitra (1997) also reported that a large proportion of accidents result from falls[12,14].

Examining behaviors of students towards accident prevention measures, the most negative behavior was related to "skiing in the school garden when it snows". It is seen that, in comparison to other behaviors, more negative student behaviors are related to "use of the school garden when there is a density of vehicles in the garden" ($\overline{X}$=3.44) and "going into the school running" ($\overline{X}$=3.46). This shows the need to prepare and conduct training programs to promote positive behavioral changes in the matter of preventing school accidents. Training about school accidents should prioritize topics in which students display most negative behaviors. Within the framework of this factor, the most positive behavior of students is about "dealing with plugs and broken electrical devices or those with stripped cables".

Within the indoor safe behaviors factor, relatively negative behaviors are related to "preferring to use blunt scissors" ($\overline{X}$=3.61) and "reading the effects of chemical substances in the laboratories" ($\overline{X}$=3.85). Within this factor, the most positive behavior of students is "when they have sharp-edged materials in their hand (pencil, scissors etc.), they take care not to prick them" ($\overline{X}$=4.35).

Within the outdoor safe behaviors factor, relatively negative behaviors were expressed in relation to "putting on knee guards and wrist supports during sports activities" ($\overline{X}$=3.16). The most positive behavior within the outdoor safe behaviors factor was in relation to "walking more carefully so as not to fall when it snows" ($\overline{X}$=4.53).

Within the school shuttle factor, the most negative behavior is "remaining standing when the shuttle is in motion" ($\overline{X}$=3.75). This result shows that students should be informed of the risks of such behavior, so as not to experience an accident while riding in the shuttle.

It was determined that student behaviors towards accident prevention measures vary according to accident status and gender ($p<0.01$). Students who had at least one accident during the previous year ($\overline{X}$=3.634) showed more negative behaviors than stu-

dents who had no accident during this time period ($\overline{X}$=4.231). This suggests that the tendency of some students towards risky behavior is an important factor in the occurrence of school accidents.

Behaviors among female students towards safety accident prevention measures ($\overline{X}$=4.029) are more positive than those of male students ($\overline{X}$=3.673). In studies by Boyce and Sobolewski (1989), Di Scala, Stark et al. (1996), Feldman et al. (1983), Christoforidis and Kambas (2007), Maitra (1997), Ergüder (2004), and Eraslan (2007), male students experienced more accidents compared to female students. These findings verify the judgment given[3,4,10,12,14-17].

Conclusion

To sum up, the following results were obtained in this study of accident occurrence among 6th, 7th and 8th grade primary education students' and their behaviors towards safety measures to prevent school accidents;

- More than half of the students stated that they have not had any accident at school during the previous year.
- Most accidents were related to falls.
- Most accidents occurred in the classroom and in the school garden.
- A considerable proportion of accidents occurred as a result of restlessness.
- More accidents occurred during spring and winter seasons than other times.
- Students' behaviors towards accident prevention measures vary according to their accident status and gender.
- Students who had at least one accident within the previous year showed more negative behaviors towards accident prevention measure compared to those students who have not had any accident.

In accordance with the findings of the present study; it can be recommended to

- Take adequate precautions to protect primary education students from school accidents and to regularly check the application of these measures,
- To regularly monitor accidents because there is no record of accidents at hospitals or schools; and, accordingly, to determine the schools at which the largest proportion of accidents is experienced and to make necessary arrangements in these schools to prevent accidents, to ensure that areas such as corridors, classrooms, stairs, gardens, school entrances and laboratories, and objects such as desks, windows and radiator used in the building do not have features likely to cause accidents; and to give priority to safety arrangements within classrooms, as this is where most accidents occur,
- To give primary education students information about accidents and prevention measures within the scope of a separate course; accordingly, to provide them with positive behaviors about the causes of accidents and related prevention measures,
- To repeat similar studies on different samples throughout Turkey, to identify potential deficiencies and to initiate restructuring in this matter.

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Effects of 12 weeks of combined exercise on the levels of visfatin, resistin, and metabolism-related hormones in a sample of Korean obese female college students

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Abstract

Visfatin and resistin are highly expressed complex proteins with insulin-like functions. They are located predominantly in the visceral adipose tissue and have been linked to obesity and type-2 diabetes. The purpose of this study was to examine the effects of 12 weeks of combined exercise on the levels of visfatin, resistin, and metabolism-related hormones in a sample of Korean obese female college students. The subjects were randomly assigned to the exercise (n = 7) and control (n = 9) groups. During the 12 weeks, the subjects in the combined exercise group were trained for 80 minutes per day for 3 days a week. The training regimen comprised the following 3 sessions: warm-up for 10 minutes, combined exercise for 60 minutes, and cool-down for 10 minutes. On the other hand, those in the control group were asked to maintain their daily normal and sedentary activities. The intensity of aerobic exercise was 60–80% of heart rate reserve for 30 minutes and that of the resistance exercise was 10–15 repetition maximum for 30 minutes. Two-way repeated ANOVA was performed. No interaction effects (time X group) were observed on the levels of resistin, glucagon, and cortisol and the neurotransmitter acetylcholine between exercise and control groups ($p > 0.05$). However, the interaction effects (time X group) on the levels of visfatin ($p = 0.017$) and insulin ($p < 0.001$) were observed. We conclude that in our sample of Korean obese female college students, 12 weeks of supervised combined exercise affected the levels of visfatin and insulin; however, it did not affect the levels of resistin and metabolism-related hormones such as glucagon and cortisol and the neurotransmitter acetylcholine.

Key words: Visfatin, Resistin, Glucagon, Insulin, Neurotransmitter acetylcholine, Cortisol, Obesity, College student

Introduction

Visfatin is a 52 kDa protein that was originally identified as pre-B-cell colony-enhancing factor (PBEF). It is secreted by both T and B lymphocytes, and can serve as a cytokine in immune regulatory action (1-3). Furthermore, visfatin is a highly expressed complex protein with insulin receptor-binding activity in visceral fat (4). A previous study indicated that plasma visfatin levels showed a strong positive correlation with fat mass but weak positive correlation with subcutaneous fat mass (4). However, because several other studies have shown that visfatin levels are not correlated to fat mass, these correlations are still controversial (5-7).

Resistin is a 12.5 kDa protein expressed and secreted by white adipose tissue; its expression is regulated by thiazolidinedione (TZD). Resistin is one of the cysteine-rich proteins that are also called resistin-like molecules (RELMs), and the term "resistin" was originally coined because this protein functions as a mediator of insulin resistance (8). Plasma resistin expression increases in obese and type-2 diabetes patients (9). Furthermore, previous studies have shown that resistin and visfatin play important roles in the pathogenesis of low-grade inflammation associated with metabolic syndrome, chronic inflammatory diseases, and autoimmune diseases (10-13). Therefore, high plasma visfatin and resistin levels are very important risk factors for chronic diseases, including obesity and type-2 diabetes.

Several studies have examined the changes in the expression levels of visfatin and resistin in response to exercise training (14-17). However, the potential association between exercise training and the changes in visfatin and resistin levels related to obesity, type-2 diabetes, and cardiovascular diseases has not yet been established. Moreover, only a few studies have examined changes in the levels of adipocytokines such as visfatin and resistin in response to combined exercise training (18). Therefore, the purpose of this study was to examine the effects of 12 weeks of combined exercise, consisting of aerobic and resistance exercises, on visfatin and resistin levels in a sample of obese Korean female college students. In addition, to increase the qualitative value of our research, we determined the levels of metabolism-related hormones such as glucagon, insulin, and cortisol and the neurotransmitter acetylcholine, which can be used for indirect evaluation of obesity after 12 weeks of combined exercise training.

Methods

Subjects

This study was approved and reviewed by the Institutional Review Board of the Human Care and Use Committee of the Society of Sport Research Institute of Dongguk University, and written consent forms were obtained from all subjects. The subjects were scheduled to participate in the combined exercise training at the Dongguk University fitness center in Gyeong-Ju, Gyeongsangbuk-Do, Korea. The subjects were female college students aged 20–26 years, who did not exercise regularly, were not previously diagnosed with abnormal glucose metabolism and other health problems, and had a body fat % of 30% which is more than 30% of the normal value. The subjects were randomly assigned to the control group (n=10) and the exercise group (n=10). However, 3 subjects from the exercise group who did not regularly attend the exercise training and 1 subject from the control group who did not participate in the post-exercise assessment were excluded from the study. Thus, 7 subjects in the exercise group and 9 subjects in the control group completed the pre- and post-exercise assessments. The characteristics of the subjects are shown in Table 1.

Experimental procedures

During 12 weeks, the subjects in the combined exercise group were trained 3 days per week for 80 minutes per day, and the training comprised the following 3 sessions: warm-up for 10 minutes, combined exercise for 60 minutes, and cool-down for 10 minutes. On the other hand, the subjects in the control group were asked to maintain their daily normal and sedentary activities. All the variables—levels of visfatin, resistin, glucagon, insulin, and cortisol and the neurotransmitter acetylcholine—were measured 2 days before the beginning of this study and 2 days after the end of the study.

Visfatin, resistin, and metabolism-related hormones

Visfatin and resistin concentrations were measured using an EIA reader (E-max precision, Molecular device, USA). Glucagon and cortisol and the neurotransmitter acetylcholine concentrations were measured using a γ-counter (Cobra-5010 Quantum, Packard, USA). Insulin concentration was measured using modular analytics (E170, Roche, Germany).

Human Visfatin ELISA Kit (Biovision, USA), Human Resistin ELISA Kit (KOMED, Korea), double antibody glucagon (Siemens, USA), insulin (Roche, Germany), Coat-A-Count Cortisol Kit (Siemens, USA), and ACTH IRMA (Brahms, Germany) were used to determine the concentrations of visfatin (ng/mL), resistin (ng/mL), glucagon (pg/mL), insulin (IU/mL), and cortisol (ng/mL) and the neurotransmitter acetylcholine (nmol/L), respectively.

Exercise program

During the 10-minute warm-up and cool-down sessions of each training regimen, the subjects in the exercise group stretched their whole body. The subjects in the exercise group performed the main exercise for 60 minutes, which consisted of 30 minutes of treadmill running at an intensity of 60–80% of their heart rate reserve (HRR), followed by 30 minutes of resistance training that included 3 sets of 10–15 repetition maximum of leg presses, leg curls, chest presses, lat pull-downs, shoulder presses, bicep curls, and sit-ups. Exercise intensity was monitored during the training sessions using a real-time system (Polar-S610, Finland).

Statistical analysis

All the results of this study are presented as average and standard deviation values. Independent *t*-tests were performed to examine differences in baseline characteristics of the subjects between the 2 groups. Two-way repeated analysis of variance (ANOVA) was used to evaluate significant changes in the dependent variables after the combined exercise training, as compared to before the exercise in the exercise group. Further, these changes were compared to those observed in the control group. Statistical significance was set at $p < 0.05$, and all analyses were performed using SPSS ver. 18.0 (SPSS, Chicago, IL, USA).

Results

The differences in the characteristics of the subjects between the groups at the baseline were insignificant ($p > 0.05$) as shown in Table 1. The changes in the levels of visfatin, resistin, glucagon, insulin, and cortisol and the neurotransmitter acetylcholine after 12 weeks of combined exercise training are shown in Table 2. Interaction effects (time X group) on resistin ($p = 0.459$), glucagon ($p = 0.126$), and cortisol ($p = 0.377$) and the neurotransmitter acetylcholine ($p = 0.434$) were not observed between exercise and control groups. However, interaction effects (time X group) on visfatin ($p = 0.017$) and insulin ($p < 0.001$) were observed.

Discussion

This study focused on the effectiveness of 12 weeks of combined aerobic and resistance exercise training on potential changes in the levels of visfatin, resistin, glucagon, insulin, and cortisol, and the neurotransmitter acetylcholine. A significant decrease was observed in the levels of visfatin and insulin; however, no significant improvement was observed in the levels of resistin, glucagon, and cortisol, and the neurotransmitter acetylcholine.

Table 1. Characteristics of the subjects (Mean ± SD)

Variables	Exercise group (n = 7)	Control group (n = 9)	T	p
Age, years	21.14 ± 1.57	20.78 ± 1.99	0.410	0.688
Height, cm	163.43 ± 7.30	160.33 ± 5.45	0.973	0.347
Weight, kg	67.07 ± 11.49	62.36 ± 7.60	0.989	0.340
BMI, kg/m^2	25.97 ± 2.73	25.18 ± 1.63	0.718	0.484
WHR, %	0.82 ± 0.04	0.80 ± 0.04	1.088	0.295
Body Fat, %	34.57 ± 2.51	32.76 ± 1.57	1.780	0.097

BMI; Body Mass Index, WHR; Waist Hip Ratio
Tested by independent t-test

Table 2. The changes in the levels of visfatin, resistin, and metabolism-related hormones after 12 weeks of combined exercise training

Categories	Exercise	Pre-exercise	Post-exercise	Interaction (Group X Time)	
				F	p
Visfatin, ng/mL	Control	2.05 ± 0.63	2.78 ± 1.66	7.285	0.017*
	Combined	2.90 ± 1.84	1.51 ± 0.70		
Resistin, ng/mL	Control	7.73 ± 2.34	5.81 ± 2.33	0.579	0.459
	Combined	6.30 ± 2.59	3.99 ± 2.03		
Glucagon, pg/mL	Control	63.81 ± 12.79	67.94 ± 12.32	2.640	0.126
	Combined	51.74 ± 10.51	46.67 ± 7.12		
Insulin, IU/mL	Control	6.88 ± 3.75	8.34 ± 1.71	17.834	<0.001***
	Combined	10.50 ± 3.50	5.23 ± 2.91		
Cortisol, ng/mL	Control	8.97 ± 2.77	12.52 ± 3.18	0.834	0.377
	Combined	10.89 ± 2.50	16.17 ± 1.92		
Neurotransmitter acetylcholine, nmol/L	Control	16.50 ± 8.34	20.79 ± 16.93	0.650	0.434
	Combined	26.33 ± 15.99	23.19 ± 8.97		

** p<0.05; *** p<0.001; Tested by two way repeated analysis of variance*

Fukuhara et al. (2005) reported that plasma visfatin levels were strongly associated with obesity and visceral fat ($r = 0.68$, $p < 0.001$) as determined by computed tomography (CT) (4). Furthermore, Lee et al. (2010) reported that exercise training decreased plasma visfatin levels in obese adolescents (17). On the other hand, Berndt et al. (2005) reported that they did not observe any significant relationship between visfatin levels and the visceral adipose tissue as assessed by CT (10). Furthermore, Ghanbari-Niaki et al. (2010) reported that plasma visfatin levels increased after exercise. Whether exercise training increases or decreases plasma visfatin levels remains controversial (19).

The result of our study shows that combined exercise training decreased plasma visfatin levels in obese college students. The precise underlying mechanisms are unclear. However, the mechanism by which combined exercise training brings about a decrease in plasma visfatin levels can be explained. We believe that combined exercise training reduces body weight, percent body fat, and the waist-hip ratio leading to a consequent decrease in plasma visfatin levels (20). Commonly, aerobic exercise training improves insulin resistance and sensitivity (21) and so does resistance exercise training (22). Furthermore, on the basis of the results of this study, we suggest that combined exercise training also improved insulin concentration. Regular exercise training including combined exercise might improve the ability of insulin to stimulate translocation of glucose transporter 4 (GLUT 4) to the muscle membrane after exercise (23).

However, in our study, the levels of resistin, the metabolism-related hormones glucagon and cortisol, and the neurotransmitter acetylcholine were not affected by the combined exercise training. Adolescence and youth are periods in which psychological changes and rapid physical growth occur, culminating in sexual maturity (24). We thought that we were unable to detect the affected metabolism-related hormones, because the rates of metabolism, fat oxidation, and substrate oxidation during youth are higher than those during adulthood (25). However, well-designed studies focusing on the young population are required for evaluating the effectiveness of combined exercise training.

Our study has 2 major limitations. First, because only female students were recruited from 1 university at Gyeong-Ju, Gyeongsangbuk-Do, Korea, this study sample did not represent the entire Korean college student population. Second, the sample size of this study was small ($n = 16$). However, this study has an advantage in that it focused on the young obese youth population, in contrast to previous studies that focused on middle-aged or older adults.

Conclusions

We conclude that 12 weeks of supervised combined exercise affected the levels of visfatin and insulin. However, it did not affect the levels of resistin and the metabolism-related hormones glucagon and cortisol and the neurotransmitter acetylcholine in our sample of Korean obese female college students.

Acknowledgement

This work was supported by a research grant from Seoul Women's University (2012)

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Survey of disaster preparedness of hospitals at Shiraz University of Medical science, Iran

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Abstract

Most developing countries are disaster prone. The history of developing countries shows many fatal disasters which have caused hundreds of thousands of deaths and hundreds of billions of dollars economic loss. During and after disasters hospitals play the main role of giving health services to people, so they should have their own planning and preparedness to present their services on time and without any interruption. This research aims to survey the preparedness scale of 9 hospitals at Shiraz University of Medical Science in disasters in Iran. The research is based on the literature review and questionnaire. These questionnaires were completed by managers and personnel. The data were gathered and analyzed by SPSS. The result shows that about 50 percent of hospitals had an education plan for disasters. The majority of hospitals did not have a crisis management committee. Building structures, installations and maintenance in fifty percent of hospitals were resistant against disasters.

Key words: Disaster, Preparedness, Hospital, Iran

Introduction

Disaster is a serious disruption of the functions of a society, causing widespread human, material, or environmental losses which exceed the ability of the affected society to cope using only its own resources. (Kent Randolph, 2008). The various types of disasters experienced by mankind can be divided into two categories: Natural and Manmade. Natural disasters such as earthquake, Tornado, flood, etc, and Man made disasters include environment pollution; pest infection, wars, transport incidents, nuclear weapon and these days terrorism. During the past century, natural disasters have dramatically effected population. Statistics indicate that during the decades of the 1990s and 2000s alone, over 4 million people lost their lives and some 90 million people were affected by the adverse impacts of natural disasters (IDNDR, 2005).

Disaster preparedness involves forecasting and taking precautionary measures prior to an imminent threat, when advance warnings are possible. Preparedness planning improves the response to the effects of a disaster by organizing the delivery of timely and effective rescue, relief and assistance. Preparedness involves the development and regular testing of warning systems (which are linked to forecasting systems) and plans for evacuation or other measures to be taken during a disaster alert period to minimize potential loss of life and physical damage. It also involves the education and training of officials, the population at risk, and intervention teams, and the establishment of policies, standards, organizational arrangements and operational plans to be applied following a disaster. Effective plans also consider securing resources, possibly including stockpiling supplies and earmarking funds. These plans must be supported by enabling legislation. (Kent, Randolph. 2004). In developing countries, while planning in preparedness increases effectiveness and efficiency of response, there are some plans which exist solely on the paper and most of the time there has been no drill.

Disasters in Iran

Statistics reveal that Iran, in comparison with other countries in the world, is severely prone to natural disasters. For example, Iran is ranked fourth in the number of lives lost due to earthquakes in the twentieth century, following China, Japan, and Italy. Historical data suggests the occurrence of a major earthquake every 2-3 years in the country. In the 20th century alone, 20 major earthquakes

claimed more than 140,000 lives, destroyed several villages and cities and caused extensive economic damage to Iran. Prior to the recent Bam earthquake, which killed more than 30,000 people, more than 200 people were killed in the Qazvin earthquake (June 2002), more than 2500 people died in an earthquake in eastern Iran and North-western Iran (1997), about 40,000 persons lost their lives in Iran's worst recorded earthquake affecting the Caspian areas of Gilan and Zanjan in 1990 (UN, 2004).

List of destructive earthquakes in Iran since 1972 is as follow:

1972 April 10th - Iran, Southern Region around Ghir Karzin: 7.1 magnitude earthquake with struck an area within a radius of more than 250 miles; 5,400 people died.

1977 March 22nd - Iran, South-eastern Coastal Region around the town of Bandar Abbas: magnitude 7 earthquake; 167 people died.

1977 April 6th – Iran, Isfahan Province: 6.5 earthquake; more than 350 people died.

1977 December 21st - Iran, Kerman Province, town of Zarand: earthquake Measuring 6.2 on the Richter scale; more than 500 people died.

1978 September 16th - Iran, Tabas: earthquake measuring between 7.5 and 7.9 on the Richter scale destroyed the town and many other villages; 15,000 people died.

1979 January 16th - Iran, Khorasan Province: earthquake measuring 7.0; 200 people died.

1979 November 14th - Iran, Eastern Region, Khorasan Province: 5.6 magnitudes Earthquake struck a string of villages between Qaen and Khaf; about 400 people died.

1981 June 11th – Iran, town of Golbaf: magnitude 6.8 earthquake 800 km (500 miles) Southeast of Tehran; the town was destroyed; more than 1,000 people died.

1990 June 21st - Iran, Caspian Regions of Gilan and Zanjan: 7.7 earthquakes caused the worst recorded disaster in the country's history: 35,000 people died and up to 100,000 were injured; some 500,000 were left homeless.

1997 February 28th - Iran, North-western Region: magnitude 5.5 earthquake; about 1,000 people died.

1997 May 10th - Iran, Eastern Region near the Afghan border: 7.1 earthquakes hit the rural area; more than 1,500 people died.

2002 June 22nd –Iran, Northern Region, and Qazvin Province: An earthquake measuring 6.3 razed dozens of villages; more than 200 people died.

2003 December 26th – Iran, Bam: An earthquake measuring 6.3 on the Richter scale Struck the historic city 1,000 km (600 miles) southeast of Tehran. Initial estimates suggested up to 10,000 deaths and more than 10,000 injured.

Earthquakes in Iran has claimed many lives and imposed a lot of damages and economical lost. Out of the 153 most catastrophic earthquakes in the world, 17.6% occurred in Iran, 15.7% in China, and 7.1% in Japan. But while economic losses from major earthquakes during 1979–1992 constituted 1.5% and 2.0% of GNP in China (Tang Shang) and the United States (Loma Prieta), respectively, losses were 7.2% in the case of Iran (Manjil), which further indicates the vulnerability of the country to natural disasters, especially earthquakes (Coburn and Spence 2006).

On the other hand human made damages have added to our problem in Iran which can create major Crisis. For example in the city of Tehran alone, some 7,000 tons of solid waste are produced daily, management of which is by no means efficient. And as far as air pollution is concerned, Tehran is believed to be one of the most polluted cities in the world, and the situation is not very different in other big cities in the country. It is estimated that some two tons of lead enter the air in Tehran daily through fossil fuel consumption by motor vehicles. All these factors have created a critical environmental situation in the country far below accepted standards and sustainable conditions (Bahraini, 2003).

Considering our culture and annual loss billions of dollars due to damage in natural and manmade disasters and claiming many lives, psychological and economical problems caused by the aftermath of disasters, we need a very strong disaster management which cover all aspects of mitigation, preparedness, response and recovery (Seyedin, 2005).Based on an old proverb in Iran; prevent better than treatment, mitigation and preparedness should be the most important principles in disaster management system of Iran.

Health services and hospitals

Every community has some coping resources to deal with accidents and emergencies. Coping resources are individuals and community skills, materials, equipment or services that can be used to meet the demands created by an incident. The health care sector forms an important part of this, from the self-administered treatments available at a pharmacy or a walk-in clinic, through the Emergency Medical Services and hospital emergency departments, to the special care provided by burn wards or other tertiary services (Manitoba, 2006).

Hospitals have their own special situation in disasters because;

- Hospitals give emergency services to patients and survivors in disasters and to save their lives quality, quantity and timing services are very important.
- There are many different groups of people in hospitals. Patients in different ages, from babies and children to old patients. All of them are very vulnerable in disasters. On the other hand, the service of some key personnel such as doctors and nurses are vital for casualties and survivors.
- There are many very expensive instruments and equipments such as MRI, CTSCAN and so on.

This information shows the importance and priority of preparedness in hospitals.

Methodology and objectives

This research is a cross-sectional and descriptive study which surveyed the preparedness situation of educational hospitals including Namazi, Faghihi, Chamran, Hafez, Khalili, Dastgheib, Ebne Sina, Zeinabie and Azzahra. These hospitals are dependant to Shiraz University of Medical Science. This research addressed 6 fundamental objectives:

1 determine if there is an educational plan against disasters
2 determine if there is a plan and guidelines for help, rescue and facilities regard to emergency services
3 determine if there is a committee of crisis management
4 determine if there is fire fighting system
5 determine if there is an appropriate evacuation plan
6 determine how resist are building structures and maintenance against disasters

The research began with a literature review on different subjects relevant to the research. After the literature review a questionnaire was prepared and sent to 27 managers and maintenance personnel in all of 9 hospitals. The questionnaire had two parts: personal information and a check list to evaluate the preparedness of hospitals. After the collection of questionnaires, all of the information gathered and analysed by SPSS software.

Results and Discussion

Education: the most important thing in disaster preparedness is education. It is a major part of reducing vulnerability to different hazards in different countries. Education may take the following forms:

- Public education, include information about actions which should be taken in case of a disaster threat or occurrence. Special training courses,
- Workshops should be designed for an adult population, either specifically or as an extra dimension of on-going programs, such as literacy or cooperative training sites. Public information, although television, radio and the printed media will never replace the impact of direct instruction, sensitively designed and projected messages can provide a useful supplement to the overall process (Kent Randolph, 2004).

In the research society, 44.4 percent of managers e.g. board managers and different executive managers in hospitals had passed crisis management course and another 55.6 percent did not have such essential information. Personnel in operational level should know how to deal with disasters to avoid any disorder. 77.8 percent of personnel had attended the related education classes, but 22.2 percent did not receive any information about how to manage the crisis. About evacuation of hospitals in disasters, just 50 percent of hospitals

Table 1. Education plan for personnel in disasters at Shiraz university hospital in 2008

Response / Criteria	No		Yes		Total
	Percent	Abundance	Percent	Abundance	
Education classes	2/22	4	8/77	14	18
Pamphlets and files	4/44	8	6/55	10	18
Education for speed evacuation	50	9	50	9	18
Using capsules	0	0	100	18	18
First aids signs	1/61	11	9/38	7	18
Exit signs and tableau	1/61	11	9/38	7	18
Emergency exits	7/16	3	3/83	15	18

educated the nursing staff some skill to evacuate patients properly. To improve public information, 55.6 percent of hospitals prepared some pamphlets. All personnel knew how to use fire fighting capsules (table 1).

Maintenance, planning and committees

Every hospital needs a major incident committee to decide policies, duties of other parts of hospital and prepare plans against disasters. The responsibility of this committee is based on the disaster management cycle including mitigation, preparedness, response and recovery; also some times there is a safety officer responsible for safety affaires in hospitals. In the research society, just 11.1 percent of hospitals had major incident committees and in 89.9 percent of hospitals this committee was not active. 44.4 percent of hospitals had employed safety officer. In the majority of hospitals, staff knew their duty during disaster (72.2) and in 27.9 percent of hospitals, their task in the crisis was not clear (table 2).

When a disaster occurs, personnel, patients and their relatives need to know ways to go out from the hospital very fast, without any confusion. In 38.9 percent of hospitals, there were some signs to show emergency exit, but in 66.1 percent there was no guidance and signs. The majority of personnel knew the emergency exit and just 16.7 percent didn't know anything about the exits.

Evacuation of patients and personnel in disasters is a main consideration of hospitals which without preparedness would be a very difficult job, so hospitals need to prepare a comprehensive plan. Although 33.1% had a comprehensive plan, in 66.7 percent of hospitals there were no plan. To clear beds, 61.1 percent of hospitals had a plan to discharge patients during disaster, while 33.3 percent had no plan (table 3).

Sometimes in disasters, power, gas and water because another disaster and sometimes horrific explosions, so it is necessary to cut the power, gas and water automatically. In 33.3 percent of hospitals, there is a system which automatically cut the utilities.66.6 percent of hospitals do not have this system. The smoker alarm notifies people fire before it causes major problems. Just 22.2 percent of hospitals had the smoker alarm. All of the fire capsules were installed well and in 77.8 percent of hospitals was checked every two months regularly (table 4).

Emergency supplies for use in the A&E department are kept in the A&E Major Incident storeroom. Also stored in this room are sets of full protective clothing and equipment for use by a Medical Incident Officer and Mobile Medical Team. In research society just 38.9 percent of hospital had provided supplies and equipments (tables 5, 6).

Table 2. Major incident committee and safety officer at Shiraz university hospitals in 2008

Response / Criteria	No response		No		Yes		Total
	Percent	Abundance	Percent	Abundance	Percent	Abundance	
Safety officer	0	0	6/55	10	4/44	8	18
Major incident committee	6/5	1	3/83	15	1/11	2	18

Table 3. Compiled plan of hospital evacuation in disasters at Shiraz university hospitals in 2008

Response / Criteria	No response		No		Yes		Total
	Percent	Abundance	Percent	Abundance	Percent	Abundance	
Evacuation instruction	0	0	66/7	12	33/3	6	18
Discharge plan	0	0	38/9	7	61/1	11	18
Free space for evacuation	5/6	1	5/6	1	88/9	16	18
Existance of departments for Rescue	0	0	44	8	56	10	18
Easy access to wards	33/3	6	16/7	3	50	9	18
Expertise physician for evacuation	0	0	66/7	12	33/3	6	18
Preparedness of related physicians	44/4	8	16/7	3	38/9	7	18

Table 4. Fire fighting systems in Shiraz university hospitals in 2008

Response / Criteria	No		Yes		Total
	Percent	Abundance	Percent	Abundance	
Automatic fire alarm	77/8	14	22/2	4	18
Appropriate installation and enough fire fighting capsules	0	0	100	18	18
Capsule using instructions	27/8	5	72/2	13	18
Easy telephone access to fire fighters	16/7	3	83/3	15	18
Regular assessment of equipment and capsules	0	0	100	18	18
Valid expire date of capsules	0	0	100	18	18

Table 5. Existing compiled instructions, equipment and facilities needed in disasters in Shiraz university hospitals in 2008

Response / Criteria	No		Yes		Total
	Percent	Abundance	Percent	Abundance	
Comprehensive major incident plan	27/8	5	72/2	13	18
Defined responsibility of every group in disaster	27/8	5	72/2	13	18
Easy access to necessary Instruments and equipments	11/1	2	88/9	16	18
Initial needs estimation in disaster	61/1	11	38/9	7	18
Fire fighting centres	33/3	6	66/7	12	18
Easy access to drinkable water	16/7	3	83/3	15	18
Real bed statistics	0	0	100	18	18
Appropriate care for babies, mothers and pregnant women	33/3	6	66/7	12	18
Vaccination preparedness	16/7	3	83/3	15	18
Lift and escalators access	72	13	28	5	18
Automatic power, water and gas cut	66/7	12	33/3	6	18
Smoking barring	72	13	28	5	18
Free telephones	55/6	10	44/4	8	18

Table 6. Building structure and installations in Shiraz university hospitals in 2008

Response / Criteria	No response		No		Yes		Total
	Percent	Abundance	Percent	Abundance	Percent	Abundance	
Technical assessment before earthquake	11/1	1	33/3	3	55/6	5	9
Technical assessment before fire	0	0	33/3	3	66/7	6	9
Compilation of directions and rules	11/1	1	22/2	2	66/7	6	9
Safety measures	٠	٠	22/2	2	77/8	7	9
Recognition of fire sensitive places	٠	٠	22/2	2	77/8	7	9
Different types of fire fighting capsules	٠	٠	٠	٠	100	9	9
Appropriate installation of capsules	٠	٠	٠	٠	100	9	9
Automatic equipment	٠	٠	88/9	8	11/1	1	9
Ert system	٠	٠	٠	٠	100	9	9
Fire fighting instrument in rubbish rooms	44/4	4	22/2	2	33/3	3	9
Waste and flammable gases	0	0	0	0	100	9	9
Special warehouse for fire sensitive materials	0	0	66/7	6	33/3	3	9
Appropriate temperature in ware houses	44/4	4	11/1	1	44/4	4	9
Fire resistance walls	33/3	3	55/6	5	11/1	1	9
Fire boxes and capsules	0	0	0	0	100	9	9
Regular assessment of fire fighting capsules	0	0	22/2	2	77/8	7	9
Smoker alarm in laboratory	0	0	77/8	7	22/2	2	9
Being the standard containers	1/11	1	11/1	1	77/8	7	9
Appropriate ventilation	0	0	11/1	1	88/9	8	9
Standard power equipment	0	0	11/1	1	88/9	8	9
Regular assessment of instruments and equipment	0	0	11/1	1	88/9	8	9

Conclusion

Iran is a very disaster prone among countries in the world.The history of Iran shows many fatal disasters which have caused tens of thousands of deaths and tens of billions dollars economic loss. During these disasters medical associations especially hospitals, play the main role of giving health services to people. Giving these vital services on time without preparedness and planning is not so straightforward. Hospitals need to mitigate the hazards threaten by natural and manmade disasters (internal or external) and prepare themselves to respond well in these disasters.

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Elazığ Başyurt Earthquake: Experiences on the Earthquake

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Abstract

Objective: An earthquake of 6.0 on the Richter Scale hit the village of Başyurt in Elazığ Province, Eastern Turkey on March 8, 2010. The epicenter was between Başyurt and Kovancılar.

Methods: We reviewed retrospectively all the injuries related to the earthquake using the medical records. We recorded patients' demographic data, their complaints, injury types and outcomes.

Results: During the study period, 74 patients presented to our emergency unit with injuries related to the earthquake. The mean age of these patients was 38.6 years (age range 0-110) and 39 of them were female. The most frequent injury occurrences were observed in the extremities (48.7%). 28 (%38.8) patients were trapped under debris. A total of 137 patients were injured and 42 patients died. Approximately 74 patients were transferred to the hospital within the first 24 hours after the incident. The rate of hospitalization was reported as 55% (74/41 patients).

Conclusion: In conclusion, rescue teams and medical teams should be prepared and buildings should be constructed in accordance with earthquake regulations. Patients should receive proper fluid treatment.

Key words: Emergency unit, earthquake, epidemiolgy

Introduction

Earthquakes represent one of the natural disasters resulting in frequent fatalities and disabilities both in the world and in Turkey. Among all other natural disasters such as flood, volcanic eruption, avalanche, hurricane, and drought, earthquakes account for the most fatal, damaging and hazardous disasters (1).

In the last century, approximately 100.000 fatalities occurred due to earthquakes in our country (2). Every year, more than 500.000 earthquakes are witnessed in the world.[3] For the last 30 years, 21 earthquakes on average have been observed per year in which more than 10 fatalities and over 100 injured people resulted. This number is gradually increasing each year. Within the last 25 years, more than 530.000 fatalities related to earthquakes were recorded in the world (3, 4).

A 6.0 magnitude earthquake measured on the Richter Scale had occurred in the village of Başyurt, Elazığ Province, Eastern Turkey on March 8, 2010 at 04:32 a.m. The earthquake affected 30.000 people in 343 residential areas, in which 42 died and 137 were injured.

This study is designed to review and present the number of patients presenting to our emergency units, examine injuries related to the earthquake, evaluate the relationship between the injuries and mortality and morbidity rates, and lastly present our data, and thereby to increase the awareness of specific aspects of earthquakes. Moreover, in our study, we also aimed to present scientific data of this particular earthquake.

Methods

The study was conducted in the three hospitals of our region where patients were admitted due to the earthquake injuries. For the study design, an "Earthquake Research Survey" form was prepared. After reviewing patient files, all injured patients presenting to the three hospitals in the region due to the earthquake were recorded retrospectively on the related forms.

Parameters such as patients' ages, sex, exposure to debris, the duration of being trapped under debris, the time when they presented to the hospitals, their complaints, diagnosis and treatment procedures, injured parts, the amount of fluid, the existence of crush syndrome, the length of stay in the emergency unit, and outcomes (hospitalization, discharge, exitus etc.) were recorded on the forms.

Data were loading to SPSS 15.0 program and frequencies and means were then determinationed.

Results

A total of 74 patients, of whom 39 (52.7%) were female, presented to our emergency unit due to the earthquake injuries. The mean age of the patients was 38.65±24.33 years (age range: 0-110). The average time of presenting to the hospital was 394.36±188.16 minutes (168-978). The score of all patients on the Glascow Coma Scale at the time of their presentation was 15. The number of patients trapped under the debris was 28 (37.8%) and the average length of stay under the debris was 49.29±77.93 (5-250) minutes.

The patients' complaints on their admission (Figure 1) were most frequently general body pain in 22 (29.7%) of them, followed by head trauma in 11 (14.9%). Extremity trauma was observed in 36 (48.7%) of the patients, soft tissue trauma was seen in 34 (45.9%) and head trauma in 23 (31%) of the patients by physical examination (Table 1). When the number of injured body parts were examined, it was determined that there were 34 (45.9%) patients with one injured part; whereas 21 (28.4%) patients had two injured parts in their bodies. 46 patients received direct radiography, ultrasonography was performed on 38 and a Doppler examination on one patient.

52 (70.3%) patients received fluid treatment between 500 and 1500 ml, with an average amount of 694.23±311.5 ml. Myoglobinuria was observed in five patients. Analgesia was performed on 43.2% of the patients, alkaline diuresis was done in two of them and one received emergency surgical intervention. No cases of compartment syndrome, Adult respiratory distres syndrome, organ loss were observed in this cohort. Fasciotomy, amputation, intubation and chest tube were not performed on any of the patients. Four patients had crush syndrome and, one of them died on the 38th day of hospital stay.

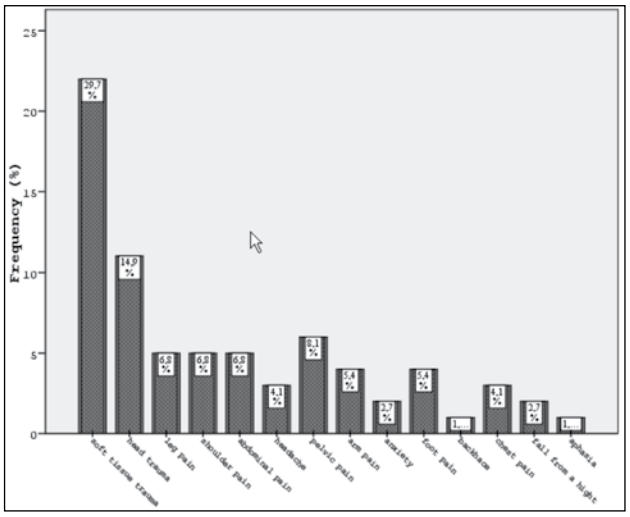

Figure 1. Complaints of patients who presented due to the earthquake

Table 1. Injury causes of patients who presented due to the earthquake

	Number of cases (n)	Percentage (%)
Extremity trauma	36	48,7
Soft tissue trauma	34	45,9
Head trauma	23	31,1
Abdominal trauma	9	12,2
Pelvic trauma	8	10,8
Chest trauma	7	9,5
Spinal trauma	6	8,1

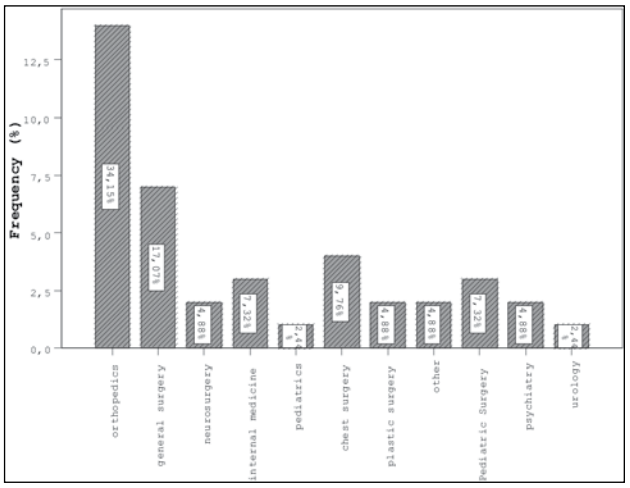

Figure 2. Clinics where patients were transferred after their admission due to the earthquake

While three (4.1%) of the patients were transferred to another health care center, 41 (55.4%) patients were hospitalized. Two patients left the emergency unit on their requests. The length of patient stays in emergency units was determined as

90.04±68.09 minutes. As a result, 28 (37.8%) patients were discharged. The clinics where most of the hospitalization occurred were orthopedic (18.9%) and general surgery (9.5%) clinics (Figure 2). Only one patient required intensive care treatment after hospitalization. The average length of hospitalization was found to be 6.83±8.59 (1-38) days.

Discussion

Among natural disasters, most commonly earthquakes lead to fatalities and injuries.[2, 5] In the 14 fatal earthquakes which have struck our country between 1995 and 2004, in total 18644 people died (6).

Crush syndrome is an important medical condition and a common problem that occurs as a result of injuries in earthquakes (7-9). In a study conducted on the Marmara earthquake in which there were more than 17.000 fatalities and 43.000 injured, crush syndrome was seen in 639 cases. 477 of these patients were treated by renal replacement therapy. 9% of them received dialysis support and 97 of them died. The median duration of the patients being trapped under the debris was found longer in that study (11.7 hours) (10).

During the initial modalities of patients in the emergency unit with a prognosis of crush injuries, in cases where patients can crystalloid solutions, mannitol and alkaline diuresis were used (9, 11). Consequently, mortality rates in crush injuries are found to be high (1, 5, 10, 12). In our study, given that the number of severe injuries was less, only one case resulted in mortality which was associated with crush syndrome since it was immediately intervened with proper treatment protocols.

A well-planned search-and-rescue team serves as an answer in an earthquake in decreasing mortality (13). Providing immediate medical support particularly within the first hours following the earthquake acts as one of the factors that increase the possibility of survival. It has long been the case where organized local volunteers and medical staff are incorporated in speeding the interventions in earthquakes. These kinds of organizations have ensured early intervention in various earthquakes, especially for the victims under debris (9, 14-17). In our province, the first intervention following the earthquake was done within the first hours of the earthquake and local volunteers, followed right away by search-and-rescue teams, saved all the injured from the debris within the first few hours.

Fluid treatment should immediately be provided to the patients who are saved from the earthquake. As an initial fluid, hypertonic saline is primarily suggested. Hypertonic saline is suggested due to its reliable and effective outcomes, even in traumas including children (9, 14, 18, 19). Analgesia and sedation treatment is recommended in patients with pain and in minor surgical interventions (9, 19). In our case, we used fluid and analgesic treatment in most of the injured patients presented to our emergency unit.

The 6.0-magnitude earthquake which occurred in the center of the Province Sultandağı in 2002 was at the same magnitude with the Elazığ earthquake. In this earthquake, it was reported that 39 people died, 325 were injured in total, the rate of patients' admission was 9.2% and orthopedic was the most common clinic where admissions were highly seen (2). In our findings, while the mortality number was similar to the one in this earthquake, our admission rate was much higher. Orthopedic clinic was also the most common clinic where patients were admitted in our study. In both earthquakes, in a similar way, crush injuries were observed rarely. Housing types in residential areas where earthquakes hit were similarly one-story house designs that were not properly constructed to endure earthquakes.

The most commonly injured organs in earthquakes are extremities, followed substantially by thoracic and abdominal traumas (1, 3, 5, 8-10, 17, 20). In the literature, there exist some publications where the most frequently observed injuries in earthquakes are listed as crush and abdominal injuries (11). The admission rates of patients are high and the most common clinic where patients are admitted is orthopedic (1, 5, 11). The sudden collapse of buildings during an earthquake that leads directly to early trauma generally accounts for fatalities in an earthquake and the fatality rate is measured at around 80%. Being trapped under debris is one of the risk factors for fatality. The severity of injuries observed in patients trapped under debris rather than the duration of staying under debris is very important in terms of prognosis (10). There are also some publications claiming the opposite (11). Individual, seismic and structural factors are of great importance in severity of injuries and fatalities in earthquakes.

Prevention and preparation efforts prior to an earthquake are also significant (14, 21, 22). Mortalities frequently occur due to crush injuries and abdominal traumas (1, 11). There also exists some studies which indicate that during the long period after the earthquakes, cardiac and other chronic diseases also count for morbidity and mortality reasons (23, 24).

In conclusion, in cases of earthquakes, we should be prepared with medical support, ready for intervention and construct proper buildings according to Earthquake Regulations. We also believe that fluid treatment should be timely and properly provided to the patients who are saved from the earthquake. Moreover, we also aimed to present the data related to the Elazığ Başyurt Earthquake with this particular study.

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Effects of Combination Therapy of Dexamethasone and Fluoxetine on Levels of Interleukin-1β and Interleukin-6 in a Rat Model of Asthma with Depressive-like Behaviors

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Abstract

The current study used a rat model of asthma with depressive-like behaviors to examine the changes of proinflammatory cytokines interleukin-1β (IL-1β) and interleukin-6 (IL-6) in the model and the effects of the combination therapy of dexamethasone and fluoxetine on the cytokines. Asthma increased the expression of IL-1β and IL-6($P < 0.05$), their levels got even higher when exposed to chronic unpredictable mild stress (CUMS). Treated with dexamethasone and fluoxetine, levels of IL-1β and IL-6 in the rats with asthma and depressive-like behaviors decreased. These data suggest that IL-1β and IL-6 are involved in asthma with depressive-like behaviors; dexamethasone combined with fluoxetine has a therapeutic effect on asthma with depressive-like behaviors by decreasing levels of IL-1β and IL-6.

Key words: effect, asthma, depressive-like behaviors, interleukin-1β, interleukin-6, dexamethasone, fluoxetine

Introduction

Asthma is a respiratory disease characterized by increased inflammatory cells infiltration into the airways and poor respiratory function, varying from a very mild disorder to a life-threatening condition. A high frequency of depression is found in asthmatic patients in some studies.[1,2,3] Asthma and depression have a complex reciprocal relationship, more asthma symptoms can lead to worse psychological outcomes, and more depressive conditions can lead to worse asthma outcomes. The mechanism of their relationship remains unknown. Studies show that IL-1β and IL-6 respectively play important roles in depression and in asthma.[4-7] But to our knowledge, how the levels of IL-1β and IL-6 change in asthma with depression has not been evaluated, and whether the the combination therapy of anti-asthma and anti-depression affects the expression of IL-1β and IL-6 has not been reported. The goals of the current study were to evaluate the changes of IL-1β and IL-6 in a rat model of asthma with depressive-like behaviors and the effect of the combination therapy of dexamethasone and fluoxetine on the cytokines.

Materials and methods

Animals

Thirty-eight male Wistar rats (180-220 g) (Shandong university, China) were used in this study. Rats were initially housed five per cage and were maintained in a 12 h:12 h light/dark cycle (lights on at 7:30 a.m.). The study was approved by the Ethics Committee for Animal Experimentation of Weifang Medical University for and was performed according to international guidelines on the use of laboratory animals.

Animal model

Sensitization and allergen challenge:

Rats were randomly divided into four groups: group 1 (control group, n=9), group 2 (asthma group, n=9), group 3 (asthma with depressive-like behaviors group, n=10), group 4 (treatment

group, n=10). Rats in group 2, group 3 and group 4 were sensitized by intraperitoneal injection of 100 mg ovalbumin (OVA) (Sigma Chemicals) emulsified in 200 mg of aluminium hydroxide in a total volume of 2 ml NS. Two weeks later, they were exposed to an aerosol of 1% OVA in NS for 20 min using an Ultrasonic nebulizer. The acute airway challenge phase consisted of once daily exposure for a total of 28 days followed by the chronic phase, which consisted of once exposure every 5 days till the end of the experiment. Control rats were sensitized and challenged with NS. We used the OVA sensitization and challenge to create asthma in rats.

Chronic unpredictable mild stress (CUMS):

CUMS has been reported to provide an effective equivalent to the precipitation of depression by CUMS, in which the behavior and mood of rats are modeled by the behavior changes during the open field and sucrose consumption tests.[8,9] After the acute OVA challenge phase, rats in group 3 and group 4 were individually housed and underwent a CUMS procedure. The CUMS procedure was slightly modified from Willner P et al [9] lasted for 28 consecutive days and consisted of one stressor (in random order) per day. Briefly, rats were exposed to different stressors, namely, 48 h food deprivation, 48 h water deprivation, 5 min cold swimming (at 4 ^{o}C), 5 min exposure to a hot room (45 ^{o}C), 2 h periods of intermittent white noise (75 dB), 1 min tail pinch, physically restraint for 1 h, 24 h of cage tilt, 24 h wet cage, overnight illumination and so on. Rats in group 1 and group 2 were left undisturbed.

Treatment

After the generation of the rat model of asthma with depressive-like behaviors, rats in group 4 were daily given intraperitoneal injection of anti-asthma drug dexamethasone (2 mg/kg) and anti-depression drug fluoxetine (10 mg/kg) orally for 14 consecutive days.

Sucrose solution consumption test

The procedure contained training and testing courses. During the training course, two bottles of 1% sucrose solution were given to each rat, 24 h later; one bottle was replaced with a bottle of tap water for 24 h to train the rats to consume 1% sucrose solution. After the training, each animal was presented simultaneously with a bottle of 1% sucrose solution and a bottle of tap water for 1 hour, following a 23 h water deprivation. The sucrose preference test was performed before CUMS, after CUMS and after treatment.

Open-field test

Open-field test was carried out after every sucrose preference test. A special black wooden arena (100cm×100cm×40 cm) which had 25 same sectors with white lines on the ground was used. Each rat was placed individually into the center of the arena and allowed to explore freely for 5 min, during which period their activity was recorded by a video camera to observe their horizontal movements and vertical movements. [8,9] Before each trial, the arena was cleaned thoroughly with 0.1% acetic acid solution.

Differential inflammatory cells counts in BALF

Twenty-four hours after the last OVA challenge, animals were sacrificed under deep chloral hydrate anesthesia, bronchoalveolar lavage fluid (BALF) was obtained from the right lung using 3 ml NS. Lavage was performed 3 times in each rat and the total volume of fluid was collected. The lavage fluid was centrifuged, cells were stained with Wright–Giemsa stain, and numbers of total leukocytes, eosinophils, lymphocytes and macrophages were differentially counted under light microscope.

Measurement of levels of IL-β and IL-6

Blood was colleted from the carotid artery with EDTA syringes and centrifuged to get plasma. The levels of IL-1β and IL-6 in plasma and in BALF were measured using ELISA, according to the manufacturer's instructions (the ELISA kits were purchased from R&D Systems, USA).

Statistical analysis

SPSS version 11.5 was used. Data were expressed as mean ± SD. The one-way ANOVA followed by Students-Newman- Keuls (SNK) test was used to determine significant differences between groups. Statistical significance was set at $P < 0.05$.

Results

Sucrose solution consumption assessments

Table 1 shows the consumption of total liquid and sucrose solution on the day before CUMS, the day after CUMS and the day after treatment. Total liquid consumption did not differ between groups on all the three different timepoints ($P > 0.05$). On the day before CUMS, rats in all groups had similar sucrose solution consumption ($P > 0.05$). However, a significant reduction can be seen in sucrose solution consumption in the CUMS- exposed rats (group 3 and group 4) as compared to group 1 and group 2 after CUMS ($P < 0.05$). And after the treatment, the sucrose solution consumption of group 4 significantly increased as compared to group 3 ($P < 0.05$). The data demonstrated that depressive behavior got better with the treatment.

Open-field assessments

Table 2 shows the numbers of horizontal and vertical movements of rats. On the day before CUMS, both the numbers of horizontal and vertical movements did not differ between groups ($P>0.05$). The 4-week CUMS exposure significantly reduced the numbers of horizontal and vertical movements of group 3 and group 4 as compared to group 1 and group 2 ($P<0.05$). The treatment significantly increased the numbers of horizontal and vertical movements of group 4 as compared to group 3 ($P<0.05$). The data also demonstrated that depressive behavior got better with the treatment.

BALF cells assessments

As shown in table 3, both OVA challenge (group 2) and OVA challenge plus CUMS exposure (group 3) induced significantly greater numbers of macrophages, eosinophils and lymphocytes than NS challenge (group 1) ($P<0.05$). What is more, there were more eosinophils in group 3 than group 2 ($P<0.05$); though there were more total leukocytes, macrophages and lymphocytes in group 3 than group 2, the difference was not statistically significant ($P>0.05$). Treatment of dexamethasone and fluoxetine (group 4) could significantly reduce the numbers of total leukocytes, macrophages, eosinophils and lymphocytes in BALF as compared to group 3 ($P<0.05$).

Proinflammatory cytokines assessments

As shown in table 4, levels of IL-1β both in plasma and BALF in group 2 significantly increased compared to those in group 1 ($P<0.05$); the level in BALF got even higher in group 3 compared to that in group 2 ($P<0.05$); However the level in BALF was significantly lower in group 4 than that

Table 1. Consumption of total liquid and sucrose solution of the rats

Group	n	Before CUMS		After CUMS		After treatment	
		Total liquid (ml)	Sucrose solution (ml)	Total liquid (ml)	Sucrose solution (ml)	Total liquid (ml)	Sucrose solution (ml)
Group 1	9	22.9±6.4	17.2±6.5	20.7±5.6	16.2±5.9	24.4±6.1	19.8±5.3
Group 2	9	23.3±6.9	18.6±7.1	20.2±4.5	16.4±4.1	22.8±5.3	19.6±4.5
Group 3	10	19.4±5.7	15.7±4.2	18.4±7.5	9.7±6.8[ab]	20.7±5.6	10.7±5.9[a]
Group 4	10	23.6±5.1	18.2±6.2	20.3±4.5	10.2±6.7[ab]	21.6±5.2	17.1±5.4[c]

Data were expressed as mean ± SD.

[a] P < 0.05 versus Group 1; [b] P < 0.05 versus Group 2; [c] P < 0.05 versus Group 3.

Table 2. Horizontal movements and vertical movements of the rats

Group	n	Before CUMS		After CUMS		After treatment	
		Horizontal movements	Vertical movements	Horizontal movements	Vertical movements	Horizontal movements	Vertical movements
Group 1	9	67.23±12.67	21.36±4.76	71.54±10.85	23.95±3.68	65.34±9.65	19.87±6.54
Group 2	9	71.27±8.69	20.95±3.21	70.16±9.66	21.67±5.63	67.89±8.70	18.90±4.31
Group 3	10	70.35±7.82	18.54±5.36	39.64±17.52[ab]	10.34±6.40[ab]	42.48±10.59[a]	12.14±4.32[a]
Group 4	10	69.68±10.23	19.86±6.13	41.19±14.21[ab]	9.79±5.54[ab]	56.73±8.39[c]	17.49±5.76[c]

Data were expressed as mean ± SD.

[a] P < 0.05 versus Group 1; [b] P < 0.05 versus Group 2; [c] P < 0.05 versus Group 3.

Table 3. Inflammatory cells in BALF in rats

Group	n	Leukocytes ($\times 10^5$)	Macrophages ($\times 10^5$)	Eosinophils ($\times 10^5$)	Lymphocytes ($\times 10^5$)
Group 1	9	40.22±6.95	7.29±0.96	0.11±0.03	13.34±2.44
Group 2	9	60.89±9.53[a]	14.89±2.88[a]	0.92±0.21[a]	17.44±3.67[a]
Group 3	10	78.65±8.41[a]	16.88±1.65[a]	1.45±0.27[ab]	20.71±4.53[a]
Group 4	10	50.13±6.35[c]	9.90±1.76[c]	0.76±0.15[c]	14.56±2.58[c]

Data were expressed as mean ± SD.
[a] $P < 0.05$ versus Group 1; [b] $P < 0.05$ versus Group 2; [c] $P < 0.05$ versus Group 3.

Table 4. IL-1β and IL-6 concentrations in plasma and BALF in rats

Group	n	IL-1β		IL-6	
		Plasma(pg/ml)	BALF(pg/ ml)	Plasma(pg/ml)	BALF(pg/ ml)
Group 1	9	21.44±5.10	89.26±15.85	25.32±4.95	66.14±8.63
Group 2	9	32.60±15.08[a]	213.03.±25.69[a]	38.60±6.24[a]	315.37±32.16[a]
Group 3	10	33.53±10.57[a]	337.57±36.29[ab]	49.36±5.57[ab]	376.94±43.52[a]
Group 4	10	26.57±8.02	146.39±18.15[c]	27.62±8.02[c]	131.86±29.81[c]

Data were expressed as mean ± SD.
[a] $P < 0.05$ versus Group 1; [b] $P < 0.05$ versus Group 2; [c] $P < 0.05$ versus Group 3.

in group 3 ($P<0.05$), which showed the treatment could decrease the level of IL-1β in BALF in rats with asthma and depressive-like behaviors.

Levels of IL-6 both in plasma and BALF in group 2 significantly increased compared to those in group 1 ($P<0.05$); the level in plasma got even higher in group 3 compared to that in group 2 ($P<0.05$). The levels both in plasma and BALF were significantly lower in group 4 than those in group 3 ($P<0.05$), which showed that the treatment could decrease the levels of IL-6 in plasma and BALF in rats with asthma and depressive-like behaviors.

Discussion

Asthma, a chronic inflammatory disease of the airways, affects many individuals worldwide[10]. It is believed that psychological and respiratory symptoms can be interrelated. Several studies well demonstrated the high prevalence of depression in patients with asthma; Lavoie KL[11] found that depressive disorders are associated with low asthma-related quality of life and low levels of asthma control. So we can come to the conclusion that depressive disorders could affect the asthma prevalence, morbidity, and mortality.

In our study, rats got asthma by the OVA sensitization and challenge, then had depressive-like behaviors by the CUMS exposure. There were more inflammation cells in BALF in the group 2 compared to the normal rats; when exposed to CUMS, there were even more BALF inflammation cells, especially eosinophils, in group 3 compared to group 2. So we concluded that depression indeed had impact on asthma.

It is believed that some proinflammatory cytokines, such as IL-1β and IL-6, are involved in asthma and in depression. And some researchers speculated that proinflammatory cytokines might play important roles in asthmatic patients with depression, but what were the levels of the cytokines like in such patients had not been detected; and the effects of the combination therapy of anti-asthma and anti-depression on the cytokines had not been reported. We designed to give dexamethasone and fluoxetine to the rats with asthma and depressive-like behaviors, and to detect the changes of levels of IL-1β and IL-6 before and after the treatment.

IL-1β is a proinflammatory cytokine that is produced by airway epithelial cells and several immune cells. It can induce leukocytosis and also induce the release of many other cytokines such as interleukin -2, -3, -4,-5, -6 -8, and TNF which are involved in asthma. Studies have demonstrated that IL-1β can alter airway function by inducing cellular infiltrate, mucus hyperplasia, airway wall thickening, fibrosis.[12,13] The production of IL-1β is usually increased in lungs of patients and animals

with asthma.[14] IL-1β also has various functions in the brain. A growing body of data suggests that IL-1β has a special role in the pathogenesis and somatic consequences of depression. Exogenous administration of IL-1β to rats has been found to produce some depressive-like symptoms. Some of the results showed an increase of IL-1β in the blood or cerebrospinal fluid of depressed patients.[15,16] Yet, some studies found that the IL-1β level was unchanged in major depressive disorder patients.[17] But, how the levels of IL-1β change in patients with both asthma and depression has not been evaluated. Our study showed that asthma increased the expression of IL-1β in plasma and BALF if compared to control rats, and interestingly the IL-1β level in BALF of group 3 got even higher when exposed to CUMS if compared to group 2. With the medication management of dexamethasone and fluoxetine, the IL-1β level in BALF in group 4 decreased, simultaneously, the depressive-like behaviors and the inflammation in lung tissue got better if compared to group 3. The results suggested that IL-1β played important role in asthma with depressive-like behaviors and the combination management of dexamethasone and fluoxetine could decrease its level.

IL-6 is considered as one of biomarkers of ongoing inflammation and a regulatory cytokine with potential to modulate the immune response, especially promoting T helper 2 (Th2) differentiation of $CD4^+$ T cells while suppressing Th1 differentiation, IL-6 also promotes the production of Th2 cytokines interleukin-4 and interleukin-5. These findings suggest that IL-6 has an important role in the development of Th2 mediated diseases, such as asthma. Actually in asthma, several studies have shown elevated IL-6 levels in BALF and serum.[5] Besides, IL-6 has systemic effects far beyond the inflammation response. It has profound effects on the CNS, it is involved in a number of psychiatric disorders, especially in major depressive disorder.[6,18,19] Significantly higher level of IL-6 in patients with major depressive disorder was reported by many researchers.[19] But some found no significant difference in IL-6 level of depressed patients,[17,20] even J. Podlipny[21] found that serum level of IL-6 was lower in a population sample with symptoms of depression than in a population sample without symptoms of depression. But how the levels of IL-6 change in patients with both asthma and depression has not been evaluated. Our study showed that asthma increased the expression of IL-6 in plasma and BALF if compared to group 1, and interestingly the IL-6 level in plasma of group 3 got even higher when exposed to CUMS if compared to group 2. With the management of dexamethasone and fluoxetine, the IL-6 levels in plasma and BALF of group 4 decreased, simultaneously, the depressive-like behaviors and the inflammation in lung tissue got better if compared to group 3. The results suggested that IL-6 was involved in asthma with depressive-like behaviors and the management of dexamethasone and fluoxetine could decrease its level.

We conclude that proinflammatory cytokines IL-1β and IL-6 are involed in asthma with depressive-like behaviors, and the combination treatment of dexamethasone and fluoxetine are effective on asthma with depressive-like behaviors by decreasing levels of IL-1β and IL-6.

Acknowledgements

This work was supported by grants from Shandong provincial Natural Science Foundation (NO. ZR2009CL045) and from Ministry of Education of China (07JAXLX005)

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Difference in the heart rate and the blood lactate level in football and hanball female players during the Conconi test

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Abstract

Heart rate and blood lactate responses on the court enable a detailed estimation of the working regime (metabolic zone) in which an athlete is trained, which is not possible to estimate only on the basis of the heart rate. These parameters are measured at rest, during exercise (lactates are measured after each work interval), and in recovery. In the end one gets curves which represent a metabolic profile of each individual. Our sample comprised 10 active female football players and 8 active female handball players who gave their written consent to take part in this research. To determine statistical significance of differences between the researched groups a method of multivariate analysis of variance (MANOVA), on a multivariate level, and a univariate analysis of variance (ANOVA), on a univariate level, were used. Research results obtained lead us to conclude that between the subjects of the first and the second group there is no difference in numeric values of the heart rate at rest and different levels of workload, nor there is any difference in the lactate level at rest, in workload and in recovery, except for the values of heart rate in the first workload of 50W. Generally speaking, research results show that both group subjects display the same functional abilities.

Key words: herat rate, lactat, conconi test, female, handball, football

Introduction

Many physiologists report that there is a linear heart rate relationship during an incremental maximum exercise test and workload. This linearity is lost with the high intensity of exercises. Breaking point is on the level of anaerobic threshold. (ANP). The moment when the heart rate does not follow the increasing workload, and the curve turns to the right, is called a deflection point. Having in mind that workloads below the threshold (dominant aerobic), on the threshold (aerobic-anaerobic) and above the threshold (dominant anaerobic) stimulate different metabolic processes. Heart rate values in certain zones of intensity are extremely important in determining the training intensity. Heart rate enables precise determination of the workload intensity only up to the anaerobic threshold. Such workloads have reversible effects on the heart thus strengthening the myocardium by decreasing the heart rate at rest, and increasing the efficiency on a submaximal workload (greater workload-lower values of HR) (Đurašković, 2002). This is the basis of the Conconi test. Heart rate and blood lactate responses on the court enable a detailed estimation of the working regime (metabolic zone) in which an athlete is trained, which is not possible to estimate only on the basis of the heart rate. These parameters are measured at rest, during exercise (lactates are measured after each work interval) and in recovery. In the end one gets curves as a metabolic profile of each individual. These curves are varied and heavily depend on the type of workload. Actually, the workload determines which parameter is to be observed and monitored as an indicator of the improvement rate. (Fratrić F., 2006).

In prolonged continuous work that engages several muscle groups (running, cycling) besides lactate it is important to monitor heart rate and consumption of V02 max. In endurance sports heart rate and the level of blood lactate should be checked every 4 weeks. There were attempts to quantify the point where the curve of heart rate bends to the right. Nu-

merous studies have shown that quantification of this point is far more exact when determined on the basis of the lactate curve. (Fratrić F., 2006).

John A. Vachon et al (John A. Vachon, 1999) investigated the validity of the heart rate deflection as a predictor of the lactate threshold during various Conconi test running protocols. In the conclusion of this study it is found that HR deflection point is not an adequate predictor of the lactate threshold.

Grazzi et al. 2005 confirmed the validity of the Conconi test and HR deflection for the determination of the anerobic threshold. The authors compared two versions of the Conconi test, of Conconi I., 1996 and Grazzi et al. 1999, on the one hand, and Ozcelik O. and Kelestimur H., 2004, on the other hand, by monitoring three important parameters (method used for the increased workload, warm-up procedure, method used for HR deflection point determination) . Ozcelik test protocol (Ozcelik O, Kelestimur H., 2004) was performed on cycle ergometer in costant rhythm while the Conconi test regulates the workload increment by the increased pedalling frequence. Conconi et al. 1996 and Grazzi et al .1999 have pointed out that this test follows the physiological demands appearing during the incremented repetitive activities (running, walking, cycling, swimming).

Adequte warm up increases body temperature and thus speeds up metabolic processes and metabolic adaptation to testing procedure (Bishop D., 2000, Amann M., 2004). Four minute low intensity warm up method (20 W) was used by Conconi F, 1996 , Grazzi G, 1999. It turned out it failed to introduce the testing subject into the adequate warm up, so the subject could not show his/her full aerobic work in the test. The third point, considered by the authors, is the method used to identify the heart rate break point (the heart rate deflection point). Objective mathematical methods avoid subjective interpretations during this test (Conconi F, 1996, Grazzi G, 1999,Rosic G 2007). In the study of Ozcelik et al, the heart rate deflection point was detected in 6 out of 16 tests on which their study is based.

Reliability and validity of the modified Conconi test was the research focus of the group of authors led by Celik O. et al., 2005. On a sample of twenty-eight oarsmen they administered three tests in three separate days. The third test was a Conconi test with the incremented workload on ergometer when the level of blood lactate was measured. The results show that the mean power output (PO) scores for the CT, CTR and ILT were 234.2 ± 40.3 W. CRT-232.-i.39.7W and ILT= 229.7±39.6 W, respectively. The mean HR values at the AT for the CT, CTR and ILT were 165.4±11.2b.min. 160.4:tl0.8b.min., and 158.3±8.8b.min., respectively. Interclass correlation coefficient (ICC) analysis indicated a significant correlation between all three tests.

Validity of HR deflection point was investigated by the Conconi test in cycling (Borgois, 2004) on a sample of eleven cyclists. A correlation between HRDP and the level of lactate was investigated. It was found that the lactate threshold appeared earlier than HRDP and it was concluded that determination of HRDP in the Conconi test was not valid for the determination of the anaerobic threshold.

Reliability of the Conconi test in determination of the anaerobic threshold (Carev D., 2002) was investigated on 22 cyclists (l1 men and 11 women). Mean values for heart rate at AT were 157.3 b.min for the Conconi test and 163.3 b.min. for V-slope method. Although there was no significant difference in the two methods the author recommends the Conconi test as a practical tool for AT determination.

G. Grazzi., F. Conconi (Grazzi G et al, 2005) have confirmed the validity of the Conconi test and HR deflection point for the estimation of the anaerobic threshold. They have compared two versions of the Conconi test, Conconi I., 1996 and Grazzi I. et al., 1999, on the one hand and Ozcelic O. and Kelestimur H., 2004, on the other hand, by considering three important points (method used to increase power output, the warm-up procedure, method used to identify the heart rate break point).

Bodner et al, 2000 reviewed previous research on the heart rate deflection point determination. They have compared the Conconi test to other similar tests only to determine that the heart rate deflection point is highly dependent on the type of the protocol used, but not all studies report reproducibility of HRDP and the lactate anaerobic threshold. The HRDP has a potential to be used not only for the training regulation purposes but also clinically, as a parameter of the workload intensity for cardiac rehabilitation.

The research problem of this study is to determine the heart rate frequency and the level of the blood lactate during the Conconi test on cycle ergometer in football and handball female players of the federal competition level.

Methods

Subject sample

The research sample comprised 10 top-rated, regular federal level competition, active, female footbal players and 8 female handball players who gave their consent prior to the onset of this study.

Variable sample

For the purpose of this research 13 variables were measured. The variables were designated as follows: (FPUMI) heart rate at rest in min., (FPUOP1) heart rate in the first minute of the test , (FPUOP2) heart rate in the second minute of the test, (FPUOP3) heart rate in the third minute of the test, (FPUOP4) heart rate in the fourth minute of the test, (FPUOP5) heart rate in the fifth minute of the test, (FPUOP6) heart rate in the sixth minute of the test, (FPUOP7) heart rate in the seventh minute of the test, (FPUOP8) heart rate in the eighth minute of the test, (FPUOP9) heart rate in the ninth minute of the test, (FPUOP10) heart rate in the tenth minute of the test. (FLAKMI) blood lactate at rest, (FLAKTE) blood lactate in the workload, (FLAKOP) blood lactate in recovery.

Blood lactate was measured in zero minute, before the test, at the end of the workload, and 10 minutes after the test. The heart rate was measured at every lap time during each change of workload. The workload was dosed in Watts. The heart rates were measured by pulsmeter "Polar". The duration of the test was measured by the pulsmeter.

The Conconi test is a very comfortable noninvasive method for measuring the anaerobic threshold (AT) (Conconi F. et al. 1984, 1996). According to the Conconi's protocol subjects undergo a 10 minute warm-up at 50% of the HR reserve, then the load is increased by 15 W every minute. Then, subjects perform a continuous ride on a bicycle ergometer for 12 minutes, starting at the load of 25W and finishing when the subject stops cycling because of the pain. HR was recorded continuously at 5 second intervals with the use of the Polar watch; the data were later downloaded to a computer for further analyses. The Polar technology needs minimum eight lap times for the software analysis, graphs display and AT point determination.

Blood samples were taken from subjects' finger, first at rest, then at the moment of test finish, and the third measurement was performed ten minutes after the rest. Blood lactate concentrations were determined using the automated lactate analyzer (Accutrend Laktate Mnanhame).

Data processing

To determine differences adequate statistical procedures were used to commensurate with the set research problem.

The data were processed and analyzed by means of the software program "Statistica 6". Basic statistical parameters were calculated: MV-mean value, SD-standard deviation, MIN-minimal values and MAX-maximal values, and R – range. To determine statistical significance of differences between the groups a method of multivariate analysis of variance (MANOVA), on a multivariate level, and univariate analysis of variance (ANOVA), on a univariate level were used.

Results

The results are shown in Tables displayed in the logical order (Tables 1-4). Values of the heart rate and lactate at rest, in workload and at recovery in football female players (first group) and handball female players (second group) are shown in Tables 1 and 2.

The values of the heart rate at rest, under workload and in recovery in female football players (the first group) are shown in Table 1. The results show that the average values of the heart rate at rest in female football players were 73.70 beats/min (the values ranged from 60 b/min to 82b/min, which is the range of 22 b/min. The values of the heart rate at the end of the test were 170.80 b/min (ranging from160 b/min to 182 b/min). Calculated maximal values of heart rate for the given age were (220-g.s) out of 200. The average values of the lactate at rest in female football players were 1.20mmol/l (from 1-1.30 mmol/1), average values of the lactate in the end of the Conconi test were 5.02 mmol/l (ranging from 1,20-10.20 mmol/l).

Table 1. Basic statistical parameters of heart rate at rest, in different workloads and in recovery in female football players

	N	Mean	Min	Max	Range	ST
FPUMI	10	73.70	60.00	82.00	22.00	7.83
FPUOPl	10	95.60	79.00	115.00	36.00	9.68
FPUOP2	10	109.50	96.00	135.00	39.00	11.67
FPUOP3	10	119.00	100.00	143.00	43.00	11.44
FPUOP4	10	124.60	108.00	146.00	38.00	10.72
FPUOP5	10	132.30	115.00	157.00	42.00	11.82
FPUOP6	10	141.20	121.00	161.00	40.00	11.04
FPUOP7	10	148.40	126.00	170.00	44.00	11.80
TPUOP8	10	157.00	137.00	174.00	37.00	10.29
FPUOP9	10	164.80	150.00	181.00	31.00	9.88
FPUOP10	10	170.80	160.00	182.00	22.00	8.51
FLAKMI	10	1.20	1.00	2.30	1.30	0.40
FLAKTE	10	5.02	1.20	10.20	9.00	2.54
FLAKOP	10	3.22	1.30	8.20	6.90	1.98

Table 2. Basic statistical parameters of heart rate at rest, in different workloads and in recovery in female handball players

	N	Mean	Min	Max	Range	ST
FPUMI	8	68.25	66.00	72.00	6.00	2.25
FPUOPl	8	106.25	96.00	117.00	21.00	7.01
FPUOP2	8	116.50	107.00	127.00	20.00	6.41
FPUOP3	8	125.13	109.00	140.00	31.00	9.86
FPUOP4	8	134.50	120.00	150.00	30.00	9.59
FPUOP5	8	141.63	122.00	158.00	36.00	11.73
FPUOP6	8	151.00	130.00	170.00	40.00	13.48
FPUOP7	8	158.88	134.00	177.00	43.00	14.21
TPUOP8	8	164.63	140.00	181.00	41.00	13.86
FPUOP9	8	172.75	156.00	188.00	32.00	12.07
FPUOP10	8	173.75	158.00	184.00	26.00	9.71
FLAKMI	8	1.36	1.00	2.10	1.10	0.42
FLAKTE	8	7.61	3.50	12.50	9.00	3.09
FLAKOP	8	4.80	1.90	7.20	5.30	1.86

The values of the heart rate at rest, under different workload and in recovery in female handball players (the second group) are shown in Table 2. The results show that the average values of the heart rate at rest in female handball players were 68.25±2.25 beats/min (the values ranged from 66 b/min to 72b/min 60 b/min, which is the range of 6 b/min. The values of the heart rate at the end of the test were 173.75±9.71b/min (ranging from 158 b/min to 184 b/min 160 b/min). The average values of the lactate at rest in female football players were 1.20mmol/l (from 1-1.30 mmol/1), average value of the lactate in the end of the Conconi test were 4.80 mmol/1(from 1.90mmol/l to 7.20mmol/l.

Table 3. Multivariate analysis of variance between female football players and female handball players (MANOVA)

Wilks Lambda	F	Effect	Error	P
0.007	89.68	16	1	0.083

The results of the multivariate analysis of variance (Table 3) between the female football players subjects and female handball players subjects show that there is no statistically significant difference between the groups in the researched area (p .083). Due to this fact there is no need to use other statistical methods. However, we give the difference between the groups defined by the ANOVA method.

Table 4. ANOVA

	Group I Mean	Std. Dev.	Group II Mean	Std. Dev.	JF	D
FPUMI	73.70	7.832	68.25	2.252	3.595	0.076
FPUOP1	95.60	9.675	106.25	7.005	6.801	0.019
FPUOP2	109.50	11.674	116.50	6414	2.301	0.149
FPUOP3	119.00	11.441	125.13	9.862	1.435	0.248
FPUOP4	124.60	10.721	134.50	9.592	4.153	0.058
FPUOP5	132.30	11.823	141.62	11.734	2.783	0.115
FPUOP6	141.20	11.043	151.00	13.480	2.882	0.109
FPUOP7	148.40	11.796	158.87	14.207	2.928	0.106
FPUOP8	157.00	10.296	164 63	13.866	1.798	0.199
FPUOP9	164.80	9.875	172.75	12.068	2.369	0.143
FPUOP10	170.80	8.509	173.75	9.706	0.472	0.502
FLAKMI	1.20	0.400	6	0.437	0.676	0.423
FLAKTE	5.02	2.540	7.61	3.094	3.820	0.068
FLAKOP	3.22	1.98	4 80	1.863	2.978	0.104

On an univariate level the obtained results in the researched area of the heart rate at rest and under workload and the level of lactate at rest, and under workload, and in recovery show that there is statistically significant difference only in the variable FPUOPI (heart rate on the first level of workload) p=0.01.

Discusion and conclusion

The values of the heart rate and the lactate at rest, under workload and in recovery in female football players (the first group) and female handball players (the second group) are shown in Tables 1 and 2. The

results show the presence of great range between the minimal and maximal heart rate which in turn points to the inhomogeneity of the female football players group whose standard deviation was 7.83 beats/min. In female handball players small range between the minimal and maximal heart rate points to the homogeneity of this group whose standard deviation was 2.25 beats/min. Workload through this test was between 80% to 91%, so with this workload range the subjects were expected to enter the anaerobic threshold, and in most subjects it did happen with the deflection point.

The female football players group that displayed in the end of the test value of 1.20 mmol/1 did not reach the anaerobic threshold, thus for them this test was not anaerobic sensitive. In contrast, those subjects whose lactate values were 10.20mmol/l have already entered the anaerobic threshold so the Conconi test was sensible enough for them. Taking in consideration that the anaerobic threshold is reached on the blood lactate level of 4 mmol its values should be monitored every three minutes so as to avod too small or too big workload in the test, due to the fact that the anaerobic threshold in the Conconi test is reached earlier with the values of the lactate than with the heart rate deflection point.

In the light of all aforementioned one can conclude that between the first and the second group subjects there is no difference between the heart rate at rest and in different levels of workload, nor there is any difference in the level of the blood lactate at rest, in workload, in recovery, except for the values of heart rate in the first workload of 50 W. This evidently leads to a conclusion that both groups subjects are of the same functional abilities.

By the analysis of the obtained results we can conclude that the numeric values of the heart rate at rest are statistically significantly lower in female handball players; this can be explained by the fact that this group has a longer sports training experience and the higher rank of competition in the Challenge cup. Heart rates during workload have on average lower values on all levels of workload in female football players. This can be accounted for by better adaptation of the cardio-vascular system to rapid increase of workload and later reaching of the anaerobic threshold.

Heart rate values in the end of the test in female football players were lower compared to the values found in female handball players. This does not mean that the female handball players have shown better results because the essence of the test is to reach the anaerobic threshold on as much higher heart rate and at the same time to reach the lactate values of 4mmol/l as late as possible, that is, in the end of the test. Female handball players finished their test with high heart rates and with significantly higher values of the blood lactate.

The average values of the level of lactate at rest, under workload and in recovery are lower in female football players. The statistically significant differences were not found in any of the analyzed level. Normal lactate values range from 1 to 1.7 mmol/1. Minimal values of the blood lactate in both samples were within the referential values but maximal values were higher than the average ones. Lower values of the blood lactate at rest point to the fact that an athlete is fully recovered from the previous workload. On the contrary, if the athlete takes up next training with the increased values of the blood lactate there is a chance of sustaining sports injuries. Therefore, the results obtained in this research can help shape the training process so that by one noninvasive method one can determine the anaerobic threshold and thus individualize the training process. In sports such as football and basketball this method can help in correcting the functional abilities of the players and thus avoid the overloading and enhance reaching the optimal conditioning.

Tables 3 and 4 show the results of the multivariate and univariate analyses of variance between the female football players and female handball players. On the univariate level the researched variables heart rate at rest, and in workload and the blood lactate in rest, in workload and in recovery, show statistically significant difference only in FPUOP1 variable (heart rate on the first level of workload). Namely, female football players have statistically lower heart rates with the workload of 50 Watts in comparison to the female handball players. This single variable cannot individually influence the existence of the differences in the researched area.

Conclusion

On the basis of the research conducted on a sample of 10 female football players and 8 female handball players the following conclusions can be drawn:

1. Research results of heart rate at rest and in different workloads during the Conconi test performed on cycle ergometer show that the numerical values of the heart rate in workload and in recovery are lower in female football players when compared to female handball players. The obtained differences are not statistically significant. Statistically significant difference was determined only in the values of the heart rate at rest.
2. Average values of the blood lactate at rest, in workload and in recovery are lower in female football players when compared to the female handball players. This is not a statistically significant difference.
3. On the basis of the obtained results we can draw a conclusion that the researched samples of the female football players and female handball players are of the same functional abilities.

Acknowledgments

We would like to express our gratitude to the Ministry of Education and Science for their support in the project OI 179019 – Biomechanic efficiency in elite Serbian athletes“, and also to the athletes who participated in this research.

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Clinicopathologic Features and Risk Factors for Breast Cancer in Northern Iran Decent

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Abstract

Background; Cancer is a third cause of death in Iran. In this regard, breast cancer is the first neoplasm of women in this country. Although our information about the etiology of breast cancer has improved, many associated risk factors are not well-described. So in this study, we tried to find probable risk factors of breast cancer and identify the clinical and pathological characteristics of breast malignancy to improve our future preventive programs.

Methods and patients; sixty-six patients with breast cancer between March 1, 2008 and December 31, 2012 were enrolled in the study.

Results; participants aged from 40 to 65years old. most of the patients were diagnosed with lobular invasive carcinoma (89.39%).Twelve (18.18%) patients had positive family history of breast cancer and pregnancy was reported in 63(95.45%) subjects and 61 patients (92.42%) had history of lactation, 7 patients (10.60%) had history of oral contraceptive (OCP). Presence of mass was observed in 57 patients (86.36%). 19 patients (28.78%) had history of pain and breast secretion was identified in 9 subjects (13.63%).

Conclusion; Based on present study, presence of breast masses were the most common complaint of patients and lobular invasive carcinoma was the most common type of breast cancer.

Key words; breast, cancer, risk factor

Introduction

According to reports from Ministry of Health and Medical Education (1,2) malignancy is a third cause of death in Iran.The incidence and mortality rates of breast tumors differ across the various countries, with a four to fivefold differentiation in incidence. The highest rates are seen in Europe and North America and Asian show the lowest amount (3).Breast cancer is the first malignancy of women in Iran (4) including 24.4% of all neoplasm with a crude incidence rate and ASR (age-standardized incidence rate)of 17.4 and 23.1 (23.65 in a Mousavi report) per 100,000, respectively (5).Although our findings about the etiology of breast cancer have progressed, many risk factors are not well-defined and we cannot do the best preventive and therapeutic procedures in order to decrease the incidence of this malignancy. Therefore in this investigation we explored the probable risk factors and clinicopathologic characteristics of breast cancer in Sari, north of Iran.

Methods and patients

Study population included patients pathologically proved with breast malignancy. Approvals for our study were obtained from the ethics committee of the university.

All cases of breast cancer were retrieved from the files of the university hospitals from March 1, 2008 and December 31, 2012.

Statistics

For statistical analysis, data were entered to MS-excel spread sheets. The procedures included were transcription, preliminary data inspection, content analysis and finally interpretation. Investigators used percentages (SPSS software, Version 17, Chicago, IL, USA) to clarify epidemiological variables.

Results

There were 66 patients aged from 40 to 65years old (mean ± SD; 56± 15). twelve (18.18%) patients had positive family history of breast cancer and pregnancy was observed in 63(95.45%) subjects and 61 patients (92.42%) had history of lactation,

7 patients (10.60%) had history of oral contraceptive (OCP) (table1). presence of mass in 57 patients (86.36%) was the most common clinical modes of presentation. 19 patients (28.78%) had history of pain and secretion from breast was identified in 9 subjects (13.63%) (table2). Lobular invasive carcinoma were the commonest histological type of cancer in our series (89.39%) (table 3).

Table 1. Distribution of risk factors for breast cancer in this study

Risk factor	Negative	Positive
Family History	54(81.81%)	12(18.18%)
Pregnancy	3(4.54%)	63(95.45%)
Lactation	5(7.57%)	61(92.42%)
OCP	59(89.39%)	7(10.60%)
alcohol	63(95.45%)	3(4.54%)
smoke	61(92.42%)	5(7.57%)

Table 2. Clinical characteristics of the study population

Symptom	Negative	Positive
Pain	47(71.21%)	19(28.78%)
Mass	9(13.63%)	57(86.36%)
Secretion	57(86.36%)	9(13.63%)

Table 3. Histological type of breast cancer in this series

Percent	Number	Pathology
89.39%	59	Lobular Invasive Carcinoma
10.60%	7	Ductal Invasive Carcinoma

Discussion

Despite recent progresses in our knowledge about risk factors and serological changes of various cancers, the regional risk factors for breast cancer and the fast implementation of multimodal concepts in neoplasm treatment associated with risk factors, breast cancer predisposal factors remains an indispensable component of potentially curative remedy(6,7). In this study, we investigated regional risk factors and different clinical modes of presentation of breast cancer and their association with final histopathological diagnosis in north of Iran.

Much knowledge gained from Western countries has revealed different risk factors and genes for breast cancer (8,9,10,11). One of them is menstrual and reproductive factors which play a crucial role for progression of breast cancer. A meta-analysis research of eight case–control investigations in Japan indicated that nulliparity and low parity were related with increased risk. (12) In year 2007 statement by the World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR) reported that lactation protects women against breast malignancy (13). In the present study, twelve (18.18%) patients had history of breast malignancy in their family and pregnancy was reported in 63(95.45%) subjects and 61 patients (92.42%) had history of lactation, 7 patients (10.60%) had history of OCP.

In consistent with the WCRF/AICR report (13) this study results didn't prove the potency of alcohol usage in development of breast cancer. Suzuki R et al (14) found a significant positive relation between alcohol usage and development of breast cancer in the Japan Public Health Center-based Prospective (JPHC) study. But in our study, alcohol consumption was reported in 3 subjects (4.54%).

The International Agency for Research on Cancer (IARC) reported the "lack of carcinogenicity of tobacco smoking in humans for cancers of the female breast". (15) But recent investigations have reported an increased risk associated with a long period and/or high number of pack-years of smoking (16). In the current study, 5 patients (7.57%) had history of smoking and most part of the participants were non-smokers.

Mahboobi A et al (17) reported invasive ductal carcinoma was the first pathologic type of breast cancer in their study. But in contrast with our study, lobular invasive carcinoma was the commonest histological type of cancer in our series (89.39%).

Preece PE et al (18) and Donegan (19) reported 15 % and 8% (respectively) of the patients with final diagnose of breast cancer had pain (major symptom) in breast. In consistent with our work, 19 patients (28.78%) had history of pain, secretion from breast was identified in 9 subjects (13.63%) and presence of mass in 57 patients (86.36%) was the most common symptom.

In conclusion, according to current research, presence of breast mass was identified as major complaint of patients and lobular invasive carcinoma reported in majority of subjects.

Acknowledgment

We thank Mrs. Nooshafarin Dargahi for great assistance.

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The relationship of subjective global assessment with respiratory function and other nutrition parameters in COPD

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Abstract

Background and purpose: Malnutrition, weight loss and low body mass in COPD (Chronic obstructive pulmonary disease) are independent and negative risk factors regarding the survival of these patients. Malnutrition may lead to the deterioration of skeletal and respiratory muscles, causing respiratory failure. Parameters used for nutritional status evaluation include anthropometry, biochemical measurements and subjective global assessment. The number of studies investigating the nutritional status using subjective global assessment in COPD patients were was limited. The aim of this study was to determine the utility of SGA for nutritional status in COPD patients and to determine the relationships between SGA, respiratory function tests, and some nutritional parameters.

Methods: The sample of the study consisted of 79 patients who were referred to Luleburgaz State Hospital, Chest Diseases Outpatient Clinic between October 2010 - February 2011 and who met the inclusion criteria as well as accepting to participate in the study. Pulmonary function tests were performed of the patients. All patients underwent subjective assessment of nutrition status using the SGA questionnaire and objective assessment through anthropometric and biochemical measurements.

Results: According to the GOLD classification, 45.4% of the patients had moderate COPD and 38% had severe COPD. It was observed that the average BMI decreased with increasing COPD severity. The FEV_1 % and FEV_1/FVC (%) values in the malnutrition group were significantly lower than the well nourished group ($p<0.05$). It was determined that the albumine and transferin levels significantly decreased with the worsening of nutritional status ($p<0.05$). There were significant and negative correlations between the SGA scores and respiratory parameters, albumine, hemoglobin, transferin and BMI.

Conclusion: SGA is a convenient instrument for evaluating the nutritional status in COPD patients and is correlated to other nutritional parameters.

Key words: chronic obstructive pulmonary disease, Subjective global assessment, nutrition.

Introduction

Chronic obstructive pulmonary disease (COPD) is an important cause of death and disability in both developed and developing countries.[1] COPD is a preventable and treatable disease and usually progressive, airway obstruction.[2] Malnutrition has been shown to enhance dyspnoea severity; reduce exercise tolerance, skeletal muscle strength and endurance; and significantly affect quality of life. Optimal nutritional status should help to improve the COPD patient's general condition and respiratory muscle function.[3] Various methods can be used in the evaluation of the nutritional state. Such methods include subjective global nutritional evaluation, evaluation of dietary intake, anthropometry, determination of body composition, and biochemical testing.[2] Subjective Global Assessment (SGA) is an easy to use, fast and cost effective method which has been developed for determining patients who exhibit malnutrition or have a risk of developing malnutrition. There are many studies using anthropometric measurements and biochemical analyses for evaluating the nutritional status of COPD patients but the number of studies investigating the nutritional status using subjective global assessment in COPD patients are limited.[4] The aim of this study was to determine the utility of SGA for nutritional status in COPD patients and to determine the relationships between SGA, respiratory function tests, and some nutritional parameters.

Methods

Study Population

The sample of the study consisted of 79 patients who were referred to Luleburgaz State Hospital, Chest Diseases Outpatient Clinic between October 2010 - February 2011 and who met the inclusion criteria as well as accepting to participate in the study. Having a COPD diagnosis according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, not having a history of acute exacerbation that requires outpatient or inpatient intervention. Patients with concomitant disease that might alter nutritional status (heart disease, cirrhosis, uncontrolled diabetes, chronic renal failure) were excluded from the study.

The data were collected in the Chest Diseases Outpatient Clinic. Firstly pulmonary function tests were performed of the patients. All patients underwent subjective assessment of nutrition

status using the SGA questionnaire and objective assessment through anthropometric and biochemical measurements. Data were collected by a trained nutritionist, and those items of the SGA questionnaire related to metabolic stress and oedema were evaluated by a clinician.

Subjective global assessment

The questionnaire used for applying SGA.[5] On the basis of the SGA findings, patients were categorised as well nourished (Category A, SGA-A), mild/moderately undernourished (Category B, SGAB) or severely undernourished (Category C, SGA-C).

Anthropometric measurements and Biochemical parameters

Anthropometric and biochemical assessments were performed as soon as the subject was admitted to the hospital. Anthropometric parameters height, weight and body mass index (BMI) were assessed in all patients. Biochemical assays, including serum albumin, transferin, hemotocrit and haemoglobin were performed at the Laboratory of the Luleburgaz State Hospital

Pulmonary Function Test

Pulmonary function tests were performed with a spirometer (ZAN 100 handy) according to the criteria set by the American Thoracic Society. FEV_1 % predicted value and FEV_1/Forced Vital Capacity (FVC) ratio were measured in these tests.

Ethical Issues: Because of the absence of the ethical committee at Kirklareli city, related permissions received from the Kirklareli Health Directorate and study was arranged according to the Helsinki Declaration.[6] All patients were informed about the procedures of the proposed study and written consents are taken.

Statistical analysis

The statistical analysis was performed by using the Statistical Package for the Social Sciences (SPSS) for Windows version 15.0. [7] During this analysis of the data, descriptive statistics were computed according to the patients' characteristics. Relationship between SGA and pulmonary function tests, BMI, serum albumin, transferin and haemoglobin were evaluated using pearson correlation analysis. Anova was used to test the difference among more than two groups. For all analysis, statistical significance was determined at the 5% level with 95% confidence intervals.

Results

The characteristics of the patients are shown in Table 1. Among the participants, 86.1% was male, mean age was 66.8 years, and mean disease duration was 9.1 years (Table 1). According to the GOLD classification, 45.4% of the patients had moderate COPD and 38% had severe COPD (Table 1). Mean BMI values according to COPD severity are shown in Table 2. Mild COPD patients had the highest mean BMI, whereas severe COPD patients had the lowest mean BMI. The FEV_1 % and FEV_1/FVC (%) values in the malnutrition group were significantly lower than the well nourished group (Table 3). Table 4 shows the biochemical analysis results of the participants according to SGA groups. The hemoglobin values of participants in the SGA-C group were significantly lower than those in the SGA-A and SGA-B groups ($p<0.05$). It was determined that the albumin and transferin levels significantly decreased with the worsening of nutritional status (Table 4). There were significant and negative correlations between the SGA scores and respiratory parameters, albumine, hemoglobin, transferin and BMI (Table 5).

Table 1. Characteristics of the participants

Variables	n	%	Mean ± SD
Age (Year)			66.8±10.0
Disease Duration(year)			9.1± 8.5
Sex : Female	11	13.9	
Male	68	86.1	
Smoking			
User	13	16.5	
Quit	59	74.7	
Never used	7	8.9	
Severity of COPD			
Mild	7	8.9	
Moderate	36	45.5	
Severe	30	38.0	
Very Severe	6	7.6	

Table 2. Mean BMI according to COPD severity

Severity of COPD	n	BMI(kg/m^2) Mean ± SD
Mild	7	28.68 ± 4.69
Moderate	36	27.86 ± 5.91
Severe	30	25.39 ± 4.86
Very Severe	6	23.96 ± 5.55

Discussion

Malnutrition is an important problem and indicator of bad prognosis in chronic obstructive pulmonary disease (COPD).[8,9,10,11] Malnutrition leads to the depletion of muscle proteins and as a result, a decrease in respiratory performance occurs.[12] In addition, it increases susceptibility to pulmonary infections. Various studies suggest that its etiology is multifactorial, and that the two principal mechanisms involved in its genesis are inadequate ingestion of food and increased energy expenditure.[2] In a study evaluating the energy and protein intake of COPD patients, it has been found that in every COPD stage the energy and protein intake of patients is below average.[13]

Various methods can be used in the evaluation of the nutritional state, Such methods include subjective global nutritional evaluation, evaluation of dietary intake, anthropometry, determination of body composition, and biochemical testing.[2]

Nutritional triage is a method of evaluating the nutritional state of hospitalized patients and can

Table 3. Mean respiratory function test results according to SGA

Respiratory function parameters	SGA-A n=40 Mean ± SD	SGA-B n=22 Mean ± SD	SGA-C n=17 Mean ± SD	p
FEV_1 %	54.5 ±16.2	51.6 ±15.0	44.0±15.8	0.024*
FEV_1/FVC (%)	66.0± 6.74	62.7 ±10.4	57.9 10.8	0.002*

†One-Way ANOVA

** p< 0.05*

Table 4. Mean biochemical values according to SGA

Biochemical parameters	SGA-A n=40 ortalama ± SD	SGA-B n=22 ortalama ± SD	SGA-C n=17 ortalama ± SD	p
Hemoglobin (g/dl)	13.58±1.57	13.72±1.42	11.08±1.04	0.000*
Hemotokrit (%)	40.76±3.99	42.11±3.50	39.20±3.64	0.284
Albumin (g/dl)	4.20±0.32	3.49±0.32	2.74±0.78	0.000*
Transferin (mg/dl)	337.38±21.35	256.51±17.32	194.78±21.11	0.000*

†One-Way ANOVA

** p< 0.05*

Table 5. The relationship between the SGA scores and some parameters

Parameters	n	r	p
FEV 1 (%)	79	- 0.261	0.020*
FEV1/FVC (%)	79	- 0.328	0.003**
Albumin (g/dl)	79	- 0.775	0.000**
Hemoglobin(g/dl)	79	- 0.617	0.000**
Transferrin(mg/dl)	79	- 0.910	0.000**
BMI(kg/m^2)	79	- 0.744	0.000**

***p<0.01, *p<0.05*

be performed through the protocol of the subjective global nutritional evaluation. The objective of the subjective global nutritional evaluation is to identify the patients who are at nutritional risk and to then establish what level of nutrition assistance should be used (primary, secondary, or tertiary).[2] Its simplicity, reliability and reproducibility are some of the traits that argue for its application in clinical practice for the nutritional assessment of COPD patients, and it correlates with the objective measures of malnutrition assessment.[3]

The BMI is a simple measurement which is used to determine the relationship between health status and weight. The BMI is one of the best valid parameters and correlates with other nutritional parameters.[14] Low BMI is an independent indicator of increased mortality in COPD patients. In one study, it has been found that every 1 kg/m2 increase in the BMI is associated with a 5% decrease in death risk.[15,16] Similarly, our results indicate that COPD severity increased with the decrease in the BMI.

Malnourished subjects have more severe impairment of pulmonary function based on FEV1% predicted. It is not clear whether poor lung function is a cause of poor nutritional status or if poor nutritional status precipitates a decline in lung function. In one study, it has been determined that there is a positive correlation between SGA scores and respiratory function parameters.[3] However, in our study, there was a weak negative correlation between the SGA scores and respiratory function parameters.

Plasma proteins are transport proteins synthesized by the liver and are known indicators of visceral protein status. Such proteins include albumin, pre-albumin, transferrin, and the retinol transport protein. Determining serum protein levels, used in conjunction with other methods of evaluating the nutritional state, is quite useful in the evaluation of patients with COPD to monitoring the nutrition therapy.[2] Although in one study it has been reported that there was no correlation between the SGA scores and biochemical parameters[3], our results indicate that there is a strong negative correlation between the SGA scores and albumin, hemoglobin and transferin proteins.

In conclusion, SGA is correlated to respiratory function tests and nutritional parameters in COPD patients. Therefore, SGA is a convenient and noninvasive method which can be used for evaluating the nutritional status of COPD patients. Further studies are needed to determine the association of SGA with respiratory function tests and biochemical and anthropometric measurements in the Turkish population.

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FI-CGA Score of old people by community based Information system

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Abstract

Objective: to establish a community based information system from comprehensive geriatric assessment of community dwelling elderly in a developing country, to predict an early identification of frailty, to risk stratification of future adverse outcomes in order to prevent and intervene diseases and disabilities of target population in home care health service schedule.

Design: Cross sectional study in districts of Karaj (North of Iran)

Participants: 195 older people living in the community already receiving traditional care services.

Method: A standard CGA form that accounts for impairment, disability, and comorbidity burden was scored and summed as a frailty index (FI-CGA). The FI-CGA was stratified to describe three levels of frailty by 2 multidisciplinary teams.

Results: The three levels of frailty were mild (FI-CGA 0–7), moderate (FI-CGA 7–13), and severe (FI-CGA>13).Demographic and social traits were similar across groups**.** Comparing patient characteristics, so that 6 patients (10.2%) were classified as mildly frail, 48(81.4%) as moderately frail, and 5 (8.4%) as severely frail.

Conclusion: Care of the elderly is a complex process and health profesionals need to be creative and capble of working in challenging situations and the FI-CGA is a valid, reliable, and sensible clinical measure of frailty that permits risk stratification of future adverse outcomes.

Key words: Disability, Frailty, Comprehensive geriatric assessment, developing country, home health care

Introduction

In 2006, the number of persons in the world aged 60 years and older was 650 million. In 2025, the number will be almost doubled and 1.2 billion people will be 60 years and older.

By 2050, this figure will have reached 2 billion people. The population of persons older than 65 years has doubled in Iran since 1987. According to the latest population study, in 2005 in Iran 7.3% of the population were older than 60 years of age (5 million).this population is estimated to increase 10 % of total population by 2020. These changes will lead to an increase in the old-age dependency ratio which will increase the total dependency ratio by the year 2020.

The elderly populations of Iran like other developing countries are increasing rapidly. These demographic changes are a direct result of the success of socio-economic development that has led to declines in mortality rates of all ages and reductions in fertility. However, an aged population might be expected to suffer from the problems of dependency and disability leading to an increased burden of disease. Adequate disability and life expectancy data are essential for planning health and social policy but these data are currently insufficient. In this regard making best use of the limited resources available for health care and integration of health care for elderly people with established health services, particularly the existing primary health care systems will be a great success.

The PHC orientation and network needs to be evaluated in terms of the health transition and Increasing non-communicable disease burden facing the country.

In this regard, Community based home care services have been developed all over the world in response to the growing elderly population and their multiple needs in health care.1. In general, a multidimensional comprehensive geriatric assessment to evaluate these patients is used, which includes functional, cognitive and mood scales as well as a social and environment assessment .studies conducted in geriatrics units seem to agree that based on multidimensional assessments prevent deterioration in functional status, and so pre-

serve autonomy, and secondly lead to a reduction of admissions in general hospitals or long-term care services.2

In Iran, there isn't any special care for elderly in our national health system. There is special attention to children and mother's care as vulnerable groups but no intention to our old people.

As the heart of geriatric medicine is comprehensive geriatric assessment (CGA). The goal, in a secondary analysis of data from the Mobile Geriatric Assessment Team (MGAT) trial, 3,4 was to construct an FI, investigate its construct validity, assay its predictive validity, test its interrater reliability, and consider its sensibility. These objectives allowed the matter of whether the frailty status of older adults can be summarized in a way that is sensible and practical for geriatricians to apply to be addressed.

The construct of frailty appears to have a firm biological basis,1 and frailty is easily recognized clinically.

Frailty has been measured by constructing a frailty index**(FI),** based on the accumulation of a variety of functional deficits (such as comorbid illness, poor health attitudes, signs of disease, and self-reported disabilities).5,6,7

In this pilot study we implanted CGA for evaluation of functional status, mental & cognitive status, affection and mood ,medications, extent of social supports of community-dwelling elderly in districts of Karaj city.

We used from FI-CGA Score which have constructed and validated by Dr.David M. Jones, MSc, MD & al)**8** in their study.. The merit of the approach is that it can be done readily from data that a geriatrician would need to gather to decide on interventions. As such, it requires no special instrumentation, beyond the clinical skills needed to do a CGA.3)

Methods and material

This study has been done in KAHRIZAK CHARITY FOUNDATION Clinic which has been established since 2007 in order to provide Home care and day care services for elderly population dwelling around the clinic in Karaj city. Our study is based on 195 persons who are admitted in the clinic for geriatric assessment and related service provision.

Because of no reliable statistic data's about elderly in developing countries who ageing is not priority for policy making ,we obtained necessary information about elderly are living in the community of Karaj in 2007. (Council of Karaj and Social Welfare Organization). The intervention and management organized by two multidisciplinary teams consist of general physician, nurses, physiotherapists, Ergo therapist, social workers, psychologists and 1 geriatrician for two teams. Each of raters completed the CGA separately. and each rater was blind to the other ratings.

Duration of our study was14 months from April 2007 to June 2008.

We could evaluate 195 old people who lived at 12 districts of Karaj at their homes. (Mohammad shahr, Mehrshahr, ect…) near to KCFDE.

All of these persons signed their consent for this pilot study. We explained the objectives of our study that is to distinguish of frail elderly who needs home care.

CGA consists of MMSE for evaluation of cognition,MNA for nutrition,GDS for depression, ADL and IADL for autonomy and tinetti for balance evaluation. Before CGA a physical exam and medical history of these personnes had done. So some socio-demographic information of subjects collected by social workers as Age, Education, economic satisfaction, Salary per month, familial situation.

Of 195 older patients refer to the study ,136 refused or withdrew before ending the assessment, leaving 59 patients with complete data for the evaluation.

Constructing the FI-CGA

Following the method used in population-based samples, 1, 6–8 the baseline FI-CGA was calculated as a count of the impairments identified at the baseline CGA. The standardized CGA used to calculate the FI comprises assessments in 10 standard domains: cognitive status, mood and motivation, communication, mobility, balance ,bowel function, bladder function, IADLs and,nutrition, and social resources 24 Problems in each domain were scored as 0 (no problem), 1 (a minor problem),or 2 (a major problem). For evaluating the contribution of each domain, the mode of the three ratings determined the value for each subject.

The mean _ standard deviation value of the FI was 7.2 ± 3.0 (median 6.7, range 1–19.2). Observing the frequency distribution of FI-CGA scores suggested three intervals corresponding to degrees of frailty: mild (FI-GCA 0–7),moderate (FI-CGA 7–13), frailty (FI-CGA≥13).

Results

Comparing patient characteristics, so that 6 patients (10.2%) were classified as mildly frail, 48 (81.4%) as moderately frail, and 5 (8.4%) as severely frail.

Table 1 shows the percentage of each catagory of elderly frailtyaccording FI-CGA and table 2 shows the characteristics of patients by grade of frailty.and table 3 indicates the Characteristic of Patients by Degree of Frailty Patients with different levels of frailty are comparable in their social and demographic characteristics.

We performed two way analysis of variants to review the effect of social variants like education, total income, general hygiene, sex in assessing the frailty (Table 4).

Different age group has been considered as block factors and other social variant effects which as follows assessed as second factors for calculating frailty index.

In our survey these factors of general hygiene , education and total income in different age groups of below and over 70 years old is considered effective factor I variants.

Table 1. FI-CGA

	Frequency	Percent
Mild	6	10/2
Moderate	48	81/4
Severe	5	8/4
Total	60	100

Table 2. Characteristics of 59 Patients from Kahrizak Charity Foundation Program for Elderly April 2007- August 2008 Iran-Karaj

Characteristic	N (percent)
AGE	
<70	20(33.9)
> 70	39(66.1)
SEX	
Male	31(51.7)
Female	29(48.3)
Education, years	
0-1	49(83.1)
Living Status	
Alone	2(3.3)
With spouse	22(37.3)
With family	31(51.7)
With relatives	4(6.8)
Children	
1	1(1.7)
2-4	18(30)
>4	41(69.3)
Social Security	
Non	21(35)
National social security Services	27(46)
Welfare organization Supportive services	12(20)
Economic Satisfaction	
YES	21(35)
no	39
Total Household Income	
Non	5(8.3)
<50	8(13.3)
50-100	7(11.7)
100-150	3(5)
150-200	20(33.3)
>200	17(28.3)
Supportive Organisation	
Has	46(76.3)
Hasn't	14(23.3)
Hygiene of life	
+	26(43.3)
-	34(57.7)
ADLs	
Activities of daily living	
Independent	18(30)
Moderately Dependent	22(36.7)
Severe Dependent	7(11.7)
Completely Dependent	12(20)
IADLs	
Instrumental ADL	
Moderately Dependent	15(25)
Severe Dependent	17(28.3)
Completely Dependent	27(45)
GDS	
Mood Evaluation	
Normal	31(51.7)
Moderate	19(31.7)
severe	2(3.3)

MNA	
Nutritional Evaluation	
>23	23(38.3)
<=	37(61.7)
Tinetti	
Balance Evaluation	
Normal	7(11.7)
Low risk fall	16(26.7)
High risk	7(11.7)
very High risk	30(50)
MMSE	
Cognitive Evaluation	
Mild cognitive impairment	21(35)
Moderate cognitive impairment	32(53.3)
Severe cognitive impairment	2(3.3)
Vision	
0	47(78.3)
1	7(11.7)
2	6(6.7)
Hearing	
0	48(80)
1	1(1.7)
2	11(18.3)
Medication	
0	3(5)
1	27(45)
2	27(45)
Incontinence urine	
Has	8(13.3)
Hasn't	51(85)
Incontinence Fecal	
Has	7(11.7)
Hasn't	52(86.7)

*Table 4. Analysis of variantes to review the effect of social variants FI = Age +Factor i + age * factor i*

Factor i	Description
Sex	Non significant
Living alone	Non significant
Housing	Non significant
General hygiene	Significant both in age groups and related factor I
Education	Only significant in education
Children	Non significant
Social security	Non significant
Economic satisfaction	Non significant
Total income	significant
Supporting organization	Non significant

Disscussion

Routinely collected data from a standardized CGAwas used to construct an FI in a secondary analysis from a controlled trial of a specialized geriatric intervention.

The merit of the FI-CGA approach offered is that it can be done readily from data that a geriatrician would need to gather to decide on interventions. As such, it requires no special instrumentation,beyond the clinical skills needed to do a CGA. In this context, whether the FI-CGA is a sensible measure can also be addressed. There is no easy numeric test for the assessmentof sensibility, but the FI-CGA is self-evidently a sensible measure by virtue of its complete account of factors theorized to influence

Table 3. Characteristic of Patients by Degree of Frailty

Characteristic	Mild Frailty (h= 6)	Moderate Frailty (h= 48)	Severe Frailty (h= 5)
Female	83/3	47/9	60
Living alone	-	100	-
Age >= 70	50	64/6	100
Age: mean I SD	67.17+-9.78	72.29+-9.85	80+-9.14
Poor self rated hygiene	0	60/4	100
Education (1-3)	50	85/4	100
Total household Income (1-4-6)	33/3	72/9	100
ADL	92/5+-12/5	67/98+-33/93	34+-46
IADL	40/83+-29/4	37/02+-32/16	15+-22/4
MMSE	21/4+-2/6	18/2+-4/5	18/2+-5/5
GDS	5/4+-3/1	5/3t3/2	5/3+-3/2
Tinetti	22/2+-10/5	15/5+-11/1	7/4+-10/3
MNA	25/2+-1/1	22/1+-3/6	18/4+-4/3

frailty. It is easy to use in the setting of specialized geriatric assessment, is readily calculated, and provides a means of risk stratification.. Recalling that frailty is an age-associated, nonspecific vulnerability, we consider symptoms, signs, diseases, and disabilities as deficits, which are combined in a frailty index. An individual's frailty index score reflects the proportion of potential deficits present in that person, and indicates the likelihood that frailty is present. Although based on a simple count, the frailty index shows several interesting properties, including a characteristic rate of accumulation, a sub maximal limit, and characteristic changes with age in its distribution. The frailty index, as a state variable, is able to quantitatively summarize vulnerability and in this article we have summrized the data collected from eldely population accroding to FI-CGA assessment tool.

As the provision of affordable and quality healthcare for older people is a major concern for health system in most countris, We think the detection of frail elderly people is a crucial point in planning health care services and organizing Home care services for target population.

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Does Nutrition Knowledge Change Nutrition Behavior?

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Abstract

Background: The aim of the present study was to establish the nutrition knowledge and behaviors of adults and determine the effects of knowledge on behavior.

Methods: A descriptive study was conducted in Ankara, the capital city of Turkey. Data was collected through a survey questionnaire. The Likert type scale was used to determine their nutrition behavior. Gender, marital status, education, age, university major, professions were considered as variables in the study. The "independent t test" was used for the variable of gender and "One-Way Anova" for education. The source of the difference among groups was identified by using the LSD Test. Nutrition knowledge and behavior questions were asked and compared to each other. The study included 400 volunteering adults who were held a minimum of a university degree.

Results: The knowledge level of individuals were observed to vary by gender, education, age, university major and profession, while behavior scores varied only by age.

Conclusion: The current study found that individuals with a high knowledge score had low behavior scores, thus showing that they failed to turn their theoretical knowledge into behavior.

Key words: Nutrition, knowledge, behavior, adult, Turkey

Introduction

Factors influencing individuals' food intake are divided into four groups: income level, price of food, price of other products, and individuals' food choices and nutrition and health knowledge. A change in consumption requires a change in at least one of these factors. Individuals' home lives and personal characteristics such as family size or educational background are also known to influence their food consumption. As it is easier for educated individuals to absorb, process and use information, they may be more knowledgeable about nutrition and reflect this in their food choices (1).

Nutrition education involves learned experiences which lead to the voluntary adoption of positive eating behaviors that assist good health. The efficiency of such education may be appropriately assessed by the resulting behavioral change (2).

In contrast to common thought, nutrition education is a challenging task as it is not easy to change the nutrition habits of people (3). Research indicates that behavioral change is directly related to the amount of nutrition education received (4).

Although knowledge is an obvious factor that is expected to bring behavioral change, the results of the studies cited in the literature are not conclusive with respect to the effects of nutrition knowledge on dietary behavior (5). While many of the studies which have analyzed the association between knowledge and dietary behavior found a positive association between the two (2, 6-11), the strength of this relationship seems to vary among studies and is generally weak (9). Comparative studies concerning the predictors of healthy nutrition habits, i.e. age, gender and education level, found that the understanding of healthy nutrition was most significantly affected by educational background (12). On the other hand, various previous studies reported that dietary behavior is influenced by demographic characteristics (13), lifestyle, health factors (14), nutrition knowledge (13, 15-18) and socio-psychological factors (13, 15, 18-20). Another study concluded that the most prevalent reason for dietary behavior change was a health-related problem (9).

In sum, previous studies showed that women had more dietary knowledge than men (7, 21-26); a higher socioeconomic (1, 24, 25) and educational level (22, 23, 25, 27, 28) indicated more ad-

vanced dietary knowledge; and middle-aged individuals were generally more knowledgeable than youngsters or elders (1, 27 ,28).

The aim of the present study was to establish the nutrition knowledge and behaviors of adults, and determine the effects of nutrition knowledge on their behavior. Our hypothesis was that nutrition knowledge is necessary for nutrition behavior change.

Materials & Methods

Participants were 400 volunteering adults residing in Ankara who were aged between 22 and 69 (247 female, 153 male). All participants were chosen randomly and held a minimum of a university degree. Data were gathered by using a questionnaire consisting of items under three headings: "General Information about Adults", "Nutrition Knowledge of Adults", and "Nutrition Behavior of Adults". The questionnaire was adapted from a study by Turrel (1997) (26).

Each correct response about nutrition knowledge was assigned 1 point, and each incorrect or undecided response was given 0. In order to identify adults' nutrition behavior, a 14-item Likert type scale was used. The responses were "always, mostly, sometimes, rarely and never" and they were allocated scores ranging between 1 and 5, with 1 indicating never and 5 indicating always. Negative statements were reverse scored. The maximum score for completing the entire knowledge questionnaire correctly was 20, while the maximum score for the behavior questionnaire was 70.

Data obtained at the end of the study were evaluated by the SPSS software. For statistical analyses, tables showing mean values, standard deviations ($\overline{X} \pm S\,D$) and percentages (%) were prepared. When identifying the nutrition knowledge of participants, "independent t test" was used for the variable of gender and "One-Way Anova" for education. The source of the difference among groups was identified by using the LSD Test, and the Pearson product-moment correlation coefficient was used to study the relationships between nutrition knowledge and behavior. Institutional Review Board approval was not required for this study.

Results

Table 1 shows the sociodemographic characteristics of participants, 61.8% of whom were females and 38.2% males. The majority were aged between 26 and 35 (44.5%) with the mean age being 35.65±8.6 (females 34.63±7.71, males 37.29±9.69). A total of 68.7% were university graduates and 48.7% had a degree in social sciences. Sixty-four percent were married, and 32.1% were working in the health sector.

Table 1. Socio-demographic characteristics (n=400)

Gender	n	%
Female	247	61.8
Male	153	38.2
Age		
≥25	44	11.0
26-35	178	44.5
36-45	120	30.0
<46	58	14.5
Education		
University	275	68.7
Msc.	70	17.5
PhD	55	13.8
University major		
Science	122	30.5
Social science	195	48.7
Health	83	20.8
Marital Status		
Married	256	64.0
Single	144	36.0
Profession		
Civil cervant	84	21.0
Military personnel	4	1.0
Self-employment	43	10.8
Health	129	32.1
Retired	5	1.3
House wife	6	1.5
Private sector	15	3.8
Education	114	28.5

The responses given to the items about nutrition knowledge are presented in Table 2. Statements that were answered correctly by more than 90% of participants included the following: "*Calcium is necessary for bone and teeth formation*" (98.8%), "*Oranges and other citrus fruits are the best sources of vitamin C*" (98.3%), "*Dairy products are the best sources of calcium"* (95.0%), "*Everybody has the same daily energy need*" (94.0%), "*Fiber*

Table 2. The responses given to the items about nutrition knowledge (%) (n=400)

Items	Female	Male	Total
1. Calcium is used for building bones and teeth.	99.6	97.4	**98.8**
2. Oranges and other citrus fruits are good sources of vitamin C.	97.6	99.3	**98.3**
3. Milk and dairy products are good sources of calcium.	95.1	94.8	**95.0**
4. Everybody has the same daily energy need.(-)	94.7	92.8	**94.0**
5. Fibre helps to regulate bowel motions.	94.3	88.2	**92.0**
6. Fruit and vegetables are a good sources of fibre.	93.5	87.6	**91.3**
7. It is recommended that adults have some milk, cheese or yoghurt everyday.	95.1	84.3	**91.0**
8. Iron is used for making red blood cells.	89.1	81.0	**86.0**
9. Chicken, fish and eggs are a good source of fibre.(-)	88.7	80.4	**85.5**
10. Protein is used for tissue building and repair.	83.4	84.3	**83.8**
11. Foods containing carbohydrate are a good source of energy.	81.8	83.7	**82.5**
12. Vitamin-mineral tablets are needed even in the presence of an adequate and balanced diet. (-)	79.4	77.1	**78.5**
13. Fats fulfill important tasks in the body.	78.1	73.2	**76.3**
14. Milk and dairy products are good sources of iron.(-)	77.3	62.1	**71.5**
15. Meat, kidney and liver are good sources of iron.	74.9	62.1	**70.0**
16. Animal foods contain cholesterol, phyto foods do not.	71.3	66.7	**69.5**
17. In a healthy diet, unsaturated fats should exceed saturated ones.	72.1	62.1	**68.3**
18. Bread, cereal, fruit and vegetables should make up the largest part of our diet.	54.7	55.6	**55.0**
19. Meat, fish, chicken and eggs should make up the largest part of our diet. (-)	60.3	67.3	**63.0**
20. Dark green vegetables such as spinach are good sources of vitamin A.	38.1	35.3	**37.0**

Table 3. Nutrition behaviors of adults (%) (n=400)

Statements		Always	Mostly	Sometimes	Rarely	Never
1. I eat two portions of fruit daily.	1	16.2	28.3	29.6	21.5	4.5
	2	11.8	21.6	37.3	20.9	8.5
2. I eat fruit and vegetables when I crave sweets.	1	3.2	18.2	30.8	31.6	16.2
	2	3.9	17.6	24.8	28.1	25.5
3. I add sugar to my drinks. (-)	1	16.2	19.4	15.0	14.2	35.2
	2	21.6	29.4	12.4	16.3	20.3
4. I spread butter or margarine as thinly as possible on bread. (-)	1	19.8	11.7	12.1	24.7	31.6
	2	9.2	19.6	17.6	22.9	30.7
5. I remove the skin from the chicken before I eat.	1	72.1	16.2	6.9	3.2	1.6
	2	46.4	19.6	15.7	5.2	13.1
6. I add sugar to breakfast cereals. (-)	1	4.5	5.7	13.0	11.3	65.6
	2	9.2	11.1	9.2	9.2	61.4
7. I drink 8 glasses of water everyday.	1	23.5	23.9	26.3	17.4	8.9
	2	21.6	34.6	22.2	13.7	7.8
8. My daily diet contains fruit and vegetables.	1	9.7	42.5	30.0	14.2	3.6
	2	7.8	25.5	34.0	26.1	6.5
9. I take the skin off before I eat fruit such as apples. (-)	1	7.3	10.1	26.7	21.1	34.8
	2	8.5	11.8	22.2	20.9	36.6
10. I eat fruit and vegetables as snacks.	1	6.5	29.6	41.7	18.6	3.6
	2	6.5	29.4	32.7	25.5	5.5
11. I eat crisps as snacks. (-)	1	1.2	3.6	15.8	31.2	48.2
	2	0.7	3.3	11.8	25.5	58.8
12. I add salt to meals after they are cooked. (-)	1	3.6	8.1	15.0	13.0	60.3
	2	3.3	15.7	11.1	19.6	50.3
13. I eat the outer leaves of vegetables such as lettuce or cabbage.	1	12.6	21.7	18.6	16.2	27.9
	2	13.1	21.6	17.6	15.0	32.7
14. I season my food with lemon juice and greens instead of salt.	1	10.9	32.0	30.4	15.8	10.9
	2	9.2	26.1	33.3	20.9	10.5

1.Female 2. Male

helps regulate bowel movement" (92.0%), "*Fruit and vegetables are the best resources of fiber*" (91.3%), and "*Adults are recommended to include milk, cheese and yoghurt in their daily diets*" (91.0%). More women responded correctly to all statements but five (2, 10, 11, 18, 19) than men.

Table 4. The knowledge and behavior mean scores of adults according to certain variables (n=400)

	The knowledge mean scores					The behavior mean scores				
	$\overline{X}$	S	t	p		$\overline{X}$	S	t	p	
Gender										
Female	16.21	2.27	3.349	0.001 [a]		34.65	6.87	-3.357	0.001 [a]	
Male	15.35	2.82				37.04	6.98			
Marital status										
Married	15.98	2.45	3.520	0.061		35.12	7.10	0.002	0.968	
Single	15.70	2.65				36.35	6.78			
Education			**F**	**p**				**F**	**p**	
University	15.56	2.54	9.369	0.000 [a]	1-3, 2-3	35.88	6.78	2.736	0.066	
Msc.	16.20	2.55				35.95	7.26			
PhD.	17.09	2.03				33.52	7.53			
Age										
<25	15.31	2.93	4.005	0.008 [a]	1-3, 2-3	37.34	6.93	12.815	0.000 [a]	1-3, 1-4, 2-3, 2-4
26-35	15.61	2.65				37.36	6.74			
36-45	16.51	2.03				33.94	6.76			
>46	15.84	2.53				32.08	6.34			
University major										
Science	16.40	2.16	17.338	0.000 [a]	1-2, 2-3	36.05	6.58	1.965	0.142	
Social science	15.16	2.65				35.83	7.37			
Health	16.80	2.27				34.22	6.62			
Profession										
Civil cervant	14.71	2.74	6.884	0.000 [a]	1-4, 1-8 3-4 4-7 4-8	35.82	7.07	0.667	0.700	
Military personnel	15.00	3.55				37.50	7.04			
Self-employment	15.41	2.55				35.76	7.37			
Health	16.88	1.88				35.86	6.74			
Retired	15.20	3.63				30.60	5.17			
House wife	16.00	2.44				33.83	7.41			
Private sector	14.73	2.25				33.66	7.40			
Education	16.00	2.54				35.46	7.16			
Total	**15.88**	**2.53**				**35.57**	**7.00**			

[a] *It is significant at 0.01 level*

Table 5. Pearson correlation matrix of certain variables used in the study (n=400)

	1	2	3	4	5	6	7	8
1.Knowledge score	1.0							
2.Behavior score	-.181 [a]	1.0						
3.Gender	-.166 [a]	.166 [a]	1.0					
4.Education	.212 [a]	-.098	-.070	1.0				
5.Age	.109 [b]	-.278 [a]	.127 [b]	.018	1.0			
6.Marital Status	-.052	.084	-.087	-.114 [b]	-.395	1.0		
7. University major	.017	-.086	-.073	-.027	-.009	-.014	1.0	
8.Profession	.0122 [b]	-.037	-.199 [a]	.246 [a]	.033	-.141 [a]	.022	1.0

[a] *Correlation is significant at 0.01 level*

[b] *Correlation is significant at 0.05 level*

Table 3 presents data about participants' nutrition behaviors. It can be seen that 62.3% reported to "always" remove the skin of chicken. More than half the participants responded "never" to the statements "I add sugar to cereal" (64.0%), "I eat crisps as snacks" (52.3%), "I add salt to my food before I even taste it" (56.5%). Responses to other items were "sometimes" and "rarely".

In Table 4, mean knowledge and behavior scores of adults are shown by considering certain variables. In the overall sample, mean knowledge score was 15.83±2.53, and mean behavior score was 35.57±7.00. While women's mean knowledge score (16.21±2.27) was higher than that of men (15.35±2.82), their mean behavior score was lower (F:34.65±6.87, M:37.04±6.98). The mean knowledge scores of married individuals were higher but their mean behavior scores were lower. As participants' educational level increased, so did their knowledge score; however, the same trend was not observed in their behavior scores. The mean knowledge scores of middle-aged participants were the highest, and behavior scores dropped with age. The knowledge scores of individuals educated in social sciences were the lowest, as was the behavior scores of individuals educated in health sciences. Considering fields of work, the knowledge scores of civil servants and the behavior scores of retirees were the lowest. It was noteworthy that while the knowledge scores of health sector workers were the highest, it was military workers whose behavior scores were the highest. Participants' mean knowledge scores varied with gender, education, age, university major and profession ($p<0.01$), while behavior scores varied only with age ($p<0.01$). Even though the knowledge scores of individuals with a PhD degree were the highest, their behavior scores were the lowest. While the knowledge scores of people with a degree or who were employed in the health sector were high, their behavior scores were not. Having low behavior scores despite a high level of knowledge shows that theoretical knowledge was not always put into practice.

According to the Pearson correlation analysis, a significant negative association existed between adults' knowledge and behavior scores and their gender (respectively r=-.181, -.166), while a significant positive association existed between their knowledge and behavior scores and their educational level (r=.21) and age (r=.109) (Table 5). Behavior scores were positively related to gender (r=.166), and negatively to age group (r=-.278).

Discussion

Perhaps the most serious problem related to nutrition is that individuals cannot easily transfer their theoretical knowledge into practice. This study was conducted to identify adults' nutrition-related knowledge and behaviors, and determine whether they could put their knowledge into practice. Of the 20 statements aiming to test knowledge, 17 were answered correctly by more than 70% of the participants. None of the participants were able to obtain the maximum score (20) in the knowledge part (15.88±2.53). The number of participants who exhibited positive behaviors related to the 14 statements aiming to identify nutrition behaviors was very small. The mean behavior score was 35.57±7.00 (out of a total of 70 points).

The knowledge level of individuals were observed to vary by gender, education, age, university major and profession, while behavior scores varied only by age ($p<0.05$). It was a noteworthy finding that individuals with a high knowledge score consistently obtained the lowest behavior scores regardless of the variable. Thus, even though individuals may have knowledge, it is possible that they do not put it into use. Likewise, Buttriss (1997) concluded that individuals failed to successfully use their theoretical knowledge in healthy food selection (24). Another study also found that knowledge of nutrition only minimally affects dietary behavior (5).

In the present study, it was seen that women, married individuals and those with a PhD degree had the highest knowledge scores. Another previous study found that women's knowledge scores varied by their educational level, and that a higher educational level meant higher knowledge scores. The same study also found that living with a partner brought higher knowledge scores than living alone (29). Özcelik and Ucar (2008) reported that women had more nutrition knowledge than men (30). Yet another study found that women's dietary knowledge scores were higher than those of men; those of middle-aged individuals were higher than younger and older people; the lowest knowledge scores belonged to the oldest age group; and a hi-

gher level of education meant a higher knowledge score (7). Stanek and Sempek (1991) associated nutrition knowledge with educational level, not nutrition knowledge scores (31). Another study found that women, individuals with a high educational level and middle-aged persons had better nutrition knowledge (1). Sapp and Jensen (1997) also reached similar conclusions (25). A study showed that men, young people and people with a high educational level had a more positive attitude towards general nutrition issues (27). The same study also identified a meaningful relationship between nutrition knowledge and health-related attitudes, general nutrition attitudes, and foods with a high fat and cholesterol content. Larzelere et al. (2005) also found that women and well-educated people had a better knowledge level, but failed to establish a link between individuals' nutrition knowledge and age (22). Parmenter et al. (2000) concluded that women, people with a high educational status, married people and middle-aged individuals had better nutrition knowledge (23). Variyam and Bloylock (1998) stated that better educated persons displayed fewer healthy eating behaviors; however, there was no difference between women and men (1). Sharma et al. (2008) found that although women were more knowledgeable than men, the nutrition behaviors of the two were similar (21). They also observed that nutrition knowledge affected nutrition behavior regarding all food groups other than fruit and vegetables.

The answers obtained in the present study regarding the fruit and vegetable consumption of individuals showed that they did not consume sufficient fruit and vegetables (statements 1,10,14,2,8 and 13). However, in other studies, it was found that people with a high daily consumption of fruit and vegetables had more advanced nutrition knowledge.

There may be various reasons why individuals do not practice their nutrition knowledge. A major reason may be the insufficiency of motivating factors (diseases, the media, family pressure and environmental pressure). In a study it was found that individuals' nutrition behaviors were determined not only by their knowledge but also by their beliefs and values (5). Another study showed that a major reason for a change in eating behaviors was the illness of a family member (24). Another reason may be a mere lack of interest in nutrition. On the other hand, correct messages about nutrition disseminated by the media may positively influence individuals' food preferences. In a study people were shown to be more interested in learning about issues such as weight loss, cancer protection, foods that improve skin condition, food safety and preservatives rather than the nutritional content of foods. The author attributed this to the fact that individuals only seek knowledge in issues that interest them (5). While Buttriss (1997) identified the biggest obstacle for individuals as absence of knowledge, this study showed that even in the presence of knowledge, people did not always put it into practice (24). It was particularly noteworthy that health sector individuals had rather low nutiriton behavior scores. This may have been due to their hectic schedule and short lunch breaks.

Conclusions

This study found that individuals with high nutrition knowledge scores had low behavior scores, thus showing that they failed to put their theoretical knowledge into practice. It is obvious that passive knowledge will not have any positive effects on human health. Although the importance and positive effects of education cannot be denied, it should be remembered that behaviors are shaped by people's life conditions. Nutrition education programs should consider the difficulty of changing existing habits, and inform individuals about how their health would be positively affected by putting their nutrition knowledge into practice. In this way, individuals would be led to healthy nutrition habits.

Acknowledgements

We wish to thank the all adults that participated in our study.

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The clinical characteristics of fungal bloodstream infection in premature infants 37 cases

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Abstract

Background: Premature infants fungal infections are common cause of morbidity and mortality in the NICU. Few studies have been done on clinical features of premature infants fungal infection. This paper focuses on the clinical characteristics**.**

Methods: A retrospective study was conducted to describe 37 cases of fungal bloodstream infection in premature infants, compared with the laboratory data (Complete blood count, CRP, Liver function, Biochemical, Electrolytes, Blood gas analysis) at 3 different time points that was hospital admission, suspected fungal infections and anti-fungal treatment for 2 weeks. One-way ANOVA was used for analysis. If equal variances assumed, LSD was performed for multiple comparisons. Equal variances not assumed, with Tamhane's T2 method for multiple comparisons.

Results: The mean time 17 days after preterm infants birth were predisposed to fungal infections. The most common species isolated from these premature infants was Candida albicans (35.1%), followed by Candida parapsilosis (29.7%), Candida famata (10.8%). The clinical manifestations of fungal bloodstream infection in premature infants were platelet reduction, poor response, poor perfusion, respiratory rhythm and heart rate change, hypothermia, weight not increase, feeding intolerance, more sputum in mechanical ventilation, difficult to withdrawal ventilator, unexplained deterioration and so on. One-way ANOVA analysis results: Plat, HCT, MCV, MCH, PDW, MPV, CRP had significant difference, F values were: 18.008, 4.018, 44.619, 47.265, 8.834, 4.681, 8.151. Liver function: ALT, TBIL, CK, CKMB, ALB, LDH had significant difference, F values were: 8.937, 6.401, 13.446, 16.699, 3.331, 77.475. Only Ca^{2+} had significant difference in blood gas and electrolyte analysis, $F = 6.292$, $p < 0.05$. Drug susceptibility results showed only 3 cases of fluconazole-resistant.

Conclusion: This study emphasizes that it highly suspect of fungal bloodstream infection to preterm infants who occurs non-specific manifestations of infectious illness, platelet reduction, CRP, PDW, MPV increase.

Key words: preterm infants; fungi; sepsis; platelets; CRP

Introduction

Abundant literatures reported: the deep fungal infection had become an important cause of nosocomial infection in the neonatal intensive care unit (NICU), prematurity, extremely low birth weight (ELBW) or very low birth weight (VLBW), central venous catheter, total parenteral nutrition, prolonged duration of antibiotics treatment were the high risk factors of fungal infections, mortality up to 20-40%[1].Fungal infections accounted for 9% in late-onset neonatal infections [2]. Neonatal fungal sepsis incidence was 0.04-0.2% in NICU, which VLBW was 3.8-12.9%, the incidence of deep fungal infections in the past 30-year had increased about 36-times [3].For example, with systemic candidiasis, 2.6% to 3.1% of VLBW infants (birth weight < 1500 g), and 5.5% to 10% of ELBW infants (birth weight < 1000 g) developed candidemia[4]. Early lack of specific clinical manifestations of fungal bloodstream infection, especially in premature infants, little data have been done on clinical features of preterm infants suffering from fungal infections. This study retrospectively analyzed clinical and laboratory data about fungal sepsis in preterm children 37 cases, including clinical manifestations, compared with laboratory test (complete blood count, CRP, liver function, biochemistry, electrolytes and blood gas analysis) at 3 different time points

that was hospital admission, suspected fungal infection and anti-fungal treatment for 2 weeks. The report was as follows.

This article was retrospective research on clinical characteristics of fungal bloodstream infection in preterm infant. Procedures was performed according to the Helsinki Declaration and approved by institutional Review Board (Institutional Review Board of The General Military Hospital of Beijing PLA).The blood sampling of preterm infants were collected according to patient condition after approval was obtained from their families during hospitalization period.

Materials and Methods

The clinical conditions of Preterm infants

There were 12 female and 25 male preterm infants. The hospital day ranged from 18 days to 129 days, with an average of hospital stay 57.44 ± 24.8 days. There were natural delivery 19 cases, cesarean section 18 cases; fetal distress 7 cases. Two and three degree amniotic fluid contamination was 5 and 2 cases; bloody amniotic fluid 2 cases. The preterm infants ranged in gestational age from 27 to 36 weeks, 27 to 30 weeks 21 cases, 31 to 33 weeks 13 cases, 35 weeks 1 case, 36 weeks 2 cases. The lowest birth weight was 800g, maximum 2815g, <1500g 24 cases, 1500 to 2500g 9 cases,> 2500g 4 cases.

The clinical conditions of Mother

The clinical conditions of mother were normal 7 cases. There were pregnancy diabetes 5 cases, pregnancy-induced hypertension 4 cases, pre-eclampsia 3 cases, kidney failure 1 case, hypothyroidism 1 case, syphilis infection 2 cases, flu in pregnancy 3 cases, double uterus pregnancy 1 case. 4 cases were treated by antibiotic during pregnancy, pregnancy fever 2 cases, amniotic membrane chorioamnionitis 7 cases. There were 19 cases of premature rupture of membrane (PROM) which ranged in time from 2 hours to 288 hours, less than 24 hours 9 cases, 31 to 100 hours 7 cases, more than 100 hours 3 cases. There were Placenta previa 1 case and oligohydramnios 2 cases.

Clinical manifestations

There were platelet reduction 22 cases, poor response 26 cases, peripheral skin cold and cyanosis 16 cases, the skin dull marble-like change 15 cases, low body temperature 15 cases, difficult to withdrawal ventilator 14 cases, frequent apnea 12 cases, bradycardia 12 cases, unable to maintain oxygen saturation without oxygen 12 cases, weight not increased 11 cases, feeding intolerance 11 cases, tachypnea 10 cases, abdominal distension 9 cases, heart rate increase 8 cases, excessive phlegm ropiness 6 cases, body temperature increase 3 cases, unexplained deterioration 4 cases.

Supplementary examination

Laboratory methods

ORION Company for the semi-automatic device TURBOXPLUS, immune turbidimetry CRP Assay kit were purchased from ORION Company, SYSMEX Corporation production XT-2000i of automated blood cell Analyzer, Germany produced by Roche COBAS INTEGRA 400 plus automatic biochemical analyzer. U.S. GEM3000 Analyzer was used for blood gas analysis.

Fungal culture and antifungal susceptibility testing

Sabouraud culture medium, CHROMagar chromogenic medium were provided by the Guangzhou Science and Technology Co. Ltd. Jing Di; API20CAUX yeast identification strip and ATBFUNGUS 3 fungal susceptibility strip were provided by France bioMerieux.

Clinical diagnosis of disease

Diagnostic criteria adopted "Practical Neonatology" the Fourth Edition. There were neonatal respiratory distress syndrome(NRDS)22 cases, neonatal pneumonia 25 cases, retinopathy of prematurity (ROP)21 cases, neonatal jaundice 18 cases, neonatal anemia 12 cases, cranial hemorrhage 7 cases, neonatal necrotizing enterocolitis (NEC)5 cases, disseminated intravascular coagulopathy (DIC)4 cases, pneumothorax 4 cases, patent ductus arteriosus bedside ligation 3 cases, congestive heart failure 1 case, renal function failure 1 case, intestinal perforation 1 case, hypoxic-ischemic encephalopathy (HIE)1 case, periventricular leukomalacia 1 case, fungal encephalitis 1 case, pulmonary hemorrhage 1 case, bronchopulmonary dysplasia 1 case, binoculus fungal choroiditis 1 case, congenital cataract 1 case.

Treatment strategies

Anti-bacterial treatment: all preterm infants were administered two or more antibiotics, such as mezlocillin, piperacillin-tazobactam, ceftazidime, sulbactam-cefoperazone, imipenem and cilastatin sodium, meropenem, vancomycin, teicoplanin, metronidazole. Anti-fungal treatment: fluconazole was administered 6 to 40 days and the mean time was 2 or 3 weeks. There were only 3 cases of fluconazole-resistant, instead voriconazole. Surfactant was administered 21 cases. Ventilator was applied 25 cases and ventilation time was 5-10 days 4 cases, 11 to 20 days 7 cases, 21 to 40 days 12 cases, ventilation time up to 60 days 2 cases. PICC catheters were applied in 3 cases; laser photocoagulation was done for ROP 4 cases, closed thoracic drainage 3 cases. The other treatments strategies included albumin, gammaglobulin, plasma, apheresis, parenteral nutrition, maintained water and electrolyte balance, symptomatic and supportive treatment.

Prognosis outcome

Cured 25 cases, improved 5 cases, given up treatment 6 cases, died 1 case.

Statistical analysis

Statistical analysis was performed with the SPSS software package (version 16.0). Measurement data were expressed as means (±standard deviations, $\bar{x} \pm s$). One-way ANOVA was used for analysis of variance. Analysis of variance had significant difference, if equal variances assumed, using LSD method for multiple comparisons, equal variances not assumed, with Tamhane's T2 method for multiple comparisons. P-value of 0.05 or lower was considered statistically significant.

Results

Premature infants blood sampling were obtained for complete blood count, liver function,biochemical,electrolytes, blood gas analysis, CRP, compared the test results among hospital admission, suspected fungal infections, and anti-fungal treatment for 2 weeks. The complete blood count and CRP changes were showed in Table 1.

As Table 1 shows that analysis of variance about Plat, HCT, MCV, MCH, PDW, MPV, CRP have significant differences. Tamhane's T2 multiple comparison results are: when body suffers from fungal infection, Platelet reduction, then recover

Table 1. Complete blood count and CRP change

	Admission $\bar{x} \pm s$	Suspected fungal infection ($\bar{x} \pm s$)	After 2 weeks of treatment ($\bar{x} \pm s$)	F	P
WBC	11.05±6.27	11.73±8.38	15.40±9.44	2.616	0.078
N	51.23±16.10	55.80±15.65	45.88±20.38	2.650	0.076
L	35.99±16.89	29.18±13.25	34.47±15.32	2.006	0.140
M	7.19±3.89	8.79±4.99	9.26±4.72	1.905	0.154
Nst	5.9±5.05	5.36±6.14	10.40±11.59	2.696	0.074#
RBC	3.95±0.72	4.11±1.01	4.18±1.12	0.512	0.601#
HB	146.99±27.09	135.92±28.05	131.25±31.94	2.636	0.077
Plat	202.57±69.58	113.24±76.33	263.18±154.03	18.008	0.000*#
Hct	0.447±0.084	0.410±0.080	0.391±0.086	4.018	0.021*
MCV	115.96±10.38	99.73±9.70	94.88±8.17	44.619	0.000*
MCH	38.25±3.15	33.16±2.96	31.68±2.46	47.265	0.000*
MCHC	329.95±17.75	333.0±15.99	334.75±12.37	0.780	0.461
RDW	16.85±1.70	17.99±2.65	17.49±2.51	2.139	0.124
PDW	13.59±2.37	16.70±3.82	15.89±2.65	8.834	0.000*#
MPV	11.06±1.21	12.12±0.96	11.32±1.19	4.681	0.012*
CRP	2.42±2.91	24.88±30.82	13.90±23.86	8.151	0.001*#

**p<0.05, # Equal variances not assumed. WBC (×10⁹/L),N (Neutrophil,%),L (Lymphocyte, %),M (Monocyte, %), Nst (Neutrphilic stab granulocyte %), RBC (×10¹²/L),HB (g/L), Plat (×10⁹/L), Hct (%),MCV(fl), MCH (pg), MCHC (g/L), RDW(%), PDW(%), MPV (fl), CRP(mg/L).*

after 2 weeks anti-fungal treatment, but the results between hospital admission and anti-fungal treatment 2 weeks are no difference. PDW is the lowest on admission, difference significant, when body suffers from fungal infection,the values of PDW increase, compared with hospital admission, difference is significant, but no difference with anti-fungal treatment 2 weeks.Inflammatory index CRP is minimum on admission, increase when body suffers from fungal infections, the values have difference between hospital admission and fungal infection, but no difference between fungal infection and anti-fungal treatment 2 weeks.LSD multiple comparative about HCT, MCV, MCH, MPV four indicators show: HCT, MCV, MCH statistical analysis results are similar: the maximum on hospital admission, difference are significance among 3 groups and the difference are also significance between hospital admission and anti-fungal treatment 2 weeks. The reason may be physiological anemia in preterm infants, iatrogenic blood loss and other factors. MPV increase in the fungal infection, then descend with the improvement of the anti-fungal treatment, difference are significance.

Liver function and biochemical changes were showed in Table 2.

Table 2 shows that One-way ANOVA about ALT, TBIL, CK, CKMB, ALB, and LDH has significance difference. Tamhane's T2 method multiple comparison: ALT gradually increase in fungal infection and after anti-fungal treatment 2 weeks, the values are significant among the three groups, indicating that fungal infection and anti-fungal treatment may be damage liver function, so clinician must be attention. CK, CKMB, LDH increase in fungal infection, but no difference compare with hospital admission, decrease significantly after anti-fungal treatment and the difference are significant. One-way ANOVA indicated that myocardial damage of fungal infection was reversible and it improved after anti-fungal treatment. LSD method multiple comparisons for TBIL, ALB, the results of TBIL are no difference between fungal infection and hospital admission, but decrease after anti-fungal treatment and have statistically significant. The value of ALB increases in fungal infection, difference significant compare with hospital admission, the reason for this may be to use iatrogenic albumin or plasma and other blood-related products, after anti-fungal treatment the results change little.

Blood gas analysis and electrolytes change were showed in Table 3.

One-way ANOVA about blood gas analysis and electrolytes changes (Table 3) shows that only calcium change has significance, minimum on hospital admission, increase in fungal infections. There are differences between two groups, but no differences compare with anti-fungal treatment. One-way ANOVA indicated that the concentration of calcium ion had an increasing trend when the body suffered from fungal infection, but not met the standards of hypercalcemia. The reason for this may be not excluded prematurity, vitamins A/D application and serum albumin increase.

Table 2. Liver function and biochemical changes

	Admission $\bar{x} \pm s$	Suspected fungal infection ($\bar{x} \pm s$)	After 2 weeks of treatment($\bar{x} \pm s$)	F	P
ALT	7.95±5.26	13.95±14.02	32.5±42.52	8.937	0.000*#
AST	68.70±36.74	61.57±20.21	57.58±22.75	1.527	0.222#
TBIL	115.50±70.49	98.65±55.72	58.47±56.07	6.401	0.003*
DBIL	17.56±7.14	27.36±19.44	31.92±39.30	2.830	0.065#
CK	358.7±487.51	570.7±475.73	82.69±137.96	13.446	0.000*#
CKMB	86.73±140.89	162.14±98.76	27.31±9.50	16.699	0.000*#
BUN	6.64±3.09	11.78±9.71	9.09±5.87	2.048	0.148#
CR	72.58±31.97	83.14±63.49	49.0±21.87	1.421	0.258
ALB	29.94±4.61	32.66±4.41	31.92±3.15	3.331	0.041*
LDH	758.70±351.80	940.00±247.68	219.21±80.16	77.475	0.000*#

**p<0.05, # Equal variances not assumed. ALT (U/L), AST (U/L), TBIL (μmol/L), DBIL (μmol/L),CK (nmol/L),CKMB (nmol/L), BUN(mmol/L), CR (μmol/L), ALB (g/L), LDH (μmol/L).*

Table 3. Blood gas analysis and electrolytes change

	Admission $\bar{x} \pm s$	Suspected fungal infection ($\bar{x} \pm s$)	After 2 weeks of treatment ($\bar{x} \pm s$)	F	P
K^+	4.94±1.24	4.54±0.45	4.72±1.11	0.751	0.476#
Na^+	140.16±6.89	139.93±6.11	138.40±4.64	0.420	0.659
CL^-	101.92±7.58	100.53±3.72	102.47±5.44	0.384	0.683
Ca^{2+}	1.70±0.37	1.98±0.34	2.06±0.28	6.292	0.004*
PH	7.33±0.11	7.33±0.09	7.36±0.21	0.147	0.864
HCO_3^-	21.55±5.93	22.36±3.80	19.73±5.92	0.470	0.628
BE	-5.27±5.81	-3.42±3.94	-4.10±7.55	0.447	0.642
PCO_2	41.59±13.39	42.70±10.25	37.14±9.15	0.466	0.631
PO_2	97.65±59.66	97.10±43.34	76.29±15.11	0.482	0.620
GLU	3.42±2.52	5.08±1.93	4.44±0.79	1.694	0.196
LAC	2.69±0.85	2.33±2.12	4.34±6.15	0.519	0.606#

**p<0.05, # Equal variances not assumed. K+(mmol/L), Na+(mmol/L), CL-(mmol/L), Ca2+(mmol/L), HCO3-(mmol/L), BE(mmol/L), PCO2(mmHg), PO2(mmHg), GLU(mmol/L), LAC(mmol/L).*

Culture strains

The time that blood culture made a definite diagnosis fungus infection ranged from 6 days to 48 days after hospital admission, with a median time of 17.35 ± 9.43 days. The most common culture strains was Candida albicans(13 cases), followed by Candida parapsilosis (11 cases), Candida famata (4 cases), Candida tropicalis (2 cases), Monilia guilliermondii (2 cases), Cryptococcus laurentii (2 cases), Candida krusei (1 case), Candida glabrata (1 case), Aspergillus fumigates(1case). Simultaneous bacteria culture of blood samples showed: acinetobacter baumannii 4 cases, staphylococcus haemolyticus 2 cases, Klebsiella pneumonia 2 cases and Escherichia coli 1 case.

Antifungal susceptibility testing

Except 3 cases of resistance to fluconazole, sensitive to voriconazole, the rest were sensitive to fluconazole.

Discussion

There were 34 cases that gestational age was less than 33 weeks, accounting for 91.9%.Weight less than 1500g were 24 cases, accounting for 64.9%. The average of hospital stay was 57 days, while VLBW infants sepsis with an average of hospital stay was 74 days and cost nearing $75,000 per case in the United States [5]. Premature rupture of membranes was still the major problem of preterm infants birth, accounting for 51.4%.As the pathophysiological characteristics of preterm infants, sometimes mechanical ventilation was unavoidable, and ventilation lasted for a long time. The ventilation preterm infants accounted for 67.6% in this group; There were 21 cases to use pulmonary surfactant; PICC catheterization 3 cases, the catheter was removed after fungus were found in blood cultures and catheter tips culture strains were consistent with the blood cultures strains. Therefore, mechanical ventilation resulted in deprived the barrier function of respiratory tract; broad-spectrum antibiotic selection pressure led flora imbalance; venous catheter increased infection and pulmonary surfactant might be a good medium for fungi. All of these eventually induced nosocomial fungus infection.

There were many foundation diseases in preterm infants and the clinical manifestation were complex, diverse and easily combined with other bacterial infections. Multiple signs and symptoms such as respiratory, intracranial, gastrointestinal and infectious illness were overlapped, all with high associated mortality. so clinical manifestation of fungal infection were easily masked by foundation diseases, also non-specific, and some even similar to the characteristic of bacterial sepsis, therefore it was at times difficult to diagnose fungus infection.The clinical manifestation of fungal sepsis in this group were as follows: the mean time of nosocomial fungal infections was 17.35 ± 9.43 days, in agreement with other studies [6,7].The most common clinical manifestation were platelet reduction, poor response, poor perfusion, respira-

tory rhythm and heart rate change, hypothermia, weight not increase, feeding intolerance, more sputum in mechanical ventilation, difficult to withdrawal ventilator and unexplained deterioration . These manifestation were non-specific, moreover, in laboratory test respects, MPV and PDW increase in fungal infection were consistent with platelet reduction due to increase both platelet destruction and platelet consumption, as well as abnormal platelet distribution led to prothrombotic state .These results were consistent with the literature report of Warris A et.al. CRP levels increase and platelet reduction might be considered as a marker of fungal infection, and also assessed the effectiveness of antifungal therapy [8].When body suffered from fungal infections, the changes of erythroid and granulocyte were not significance, but platelet reduction, CRP, PDW and MPV increase had clinical significance. The changes of ALT, TBIL, CK, CKMB, LDH, ALB, Ca^{2+} only showed that the liver and myocardium suffered from damage in fungal infection, then recovered after anti-fungal treatment. It was non-specific to diagnose fungal sepsis, therefore, the possibility of complicating fungal infection should be considered when premature infants occurred infectious illness.

The highest detection rate of fungal infection was Candida albicans (13 cases, 35.1%) in the group, followed by Candida parapsilosis (11 cases, 29.7%). There were many types of Candida, including Candida albicans, Candida tropicalis, Candida krusei, Candida parapsilosis and other Candida pseudo-tropical. Candida albicans was the most common opportunistic pathogen and pathogenic virulence was also the strongest in many kinds of Candida. Most newborns in the oral cavity and gastrointestinal tract have original colonization which can be transformed into the dominant species and pathogenic in flora imbalance. Its strong adhesion capacity, very easy colonization in the catheter surface formed biofilm in glucosilated solutions to evade the host immune response and antimicrobial agents.At present, Candida albicans infection had become a serious clinical problem, blood culture positive rate followed by the E. coli and Staphylococcus aureus [9].The incidence of bloodstream infection caused by Candida progressively increase every year. Population-based data from Finland during 1995-1999, the average annual incidence of candidemia had increased markedly from 1.9 to 2.86 per 100,000 population[10],while incidences was higher elsewhere in Europeand considerable higher (10.4 per 100,000 population) in Denmark [11].Once Candida sepsis was found, PICC catheter should be removed, otherwise, it prolonged duration of bacteremia and might lead the mortality increase. Candida parapsilosis was easy to form mucus in the glucose solution and successfully attach on plastic catheter. The infection mainly was found in epidermal barrier integrity damage of preterm children caused by received invasive treatment and instruments monitor. It was the most common types of fungal colonization on catheter. PICC catheter tips culture 3 cases were found Candida parapsilosis in the group and it was closely related to total parenteral nutrition and also easy to spread by health care workers with hand contacting preterm infants.

Neonatal fungal infection often disseminated and made end- organ involvement, such as central nervous system, urinary system, joints, eye and endocardium, etc. Although the treatment was timely in this group, it still occurred fungal endophthalmitis 1 case, fungal meningitis 1 case, congestive heart failure 1 case, renal function failure 1 case, intestinal perforation 1 case, periventricular leukomalacia 1 case, NEC 5 cases, DIC4 cases. About the treatment, advocator tried to prolong the time for anti-fungal treatment which should continue at least 2 weeks to prevent recurrence of fungal infection after the blood culture, body fluid culture were negative or local lesions disappeared [12]. Antifungal therapy strategies in this group were: the amount of cure fluconazole 6 mg / kg, the amount of prevention 3 mg / kg, gestational age30-36 weeks, within 14 days of birth, once administration every other day, more than 14 days of birth, 1 time / day; gestational age $\leq$ 29 weeks, within 14 days of birth, once administration every two day, more than 14 days of birth, once administration every other day. The longest time of fluconazole administration was 40 days in this group, the majority time of application fluconazole were 2 weeks or 3 weeks. Liver and kidney functions are no significant damage in the Table 2.

As the fungal diagnostic reasons, blood culture, albeit a gold standard test, can possibly identify only a small fraction of the total number of candi-

demia. Fungal infection incidence might be even higher than the reports currently. Preterm infants were easy to fungal infection, and were predisposed to occurring serious sequelae of central nervous system. Prevention was the optimal strategy [13].There were a large number of evidence concerning application fluconazole on the prevention of fungal infections in preterm infant [14-17], preterm infant (weight＜1000g), twice weekly intravenous administration of fluconazole was more effective than oral nystatin in prevent fungal infections, but the attendant problem was fluconazole drug resistance, reported on the rate of fluconazole resistance was 5.5% [18]. There were 3 cases fluconazole-resistant, but sensitive to voriconazole in this group. Frankenbusch.K though that 4mg/kg daily dose with two weeks could achieve clinical treatment effect. Loading dose was 3mg/kg once, then modified 2mg/kg·time after12 hours [19].Our methods are that voriconazole (4mg/kg q12h) with 2 weeks can control the infection. With beneficial bacteria and lactoferrin and other measures had been reported to enhance the innate immune and to prevent fungal infections[20,21].

Acknowledgment

We acknowledge the exceptional work of Medical Record Administrators and the Laboratory colleagues in The General Military Hospital of Beijing PLA

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Postpartum Depression Among Working and Non-working Women in Denizli, Turkey

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Abstract

Purpose: In the current study we aimed: (1) to report the prevalence of postpartum depression (PPD) among Turkish women in Denizli province; (2) description of the association of PPD with risk factors among working and non-working women.

Methods: A descriptive and cross-sectional study conducted at the Maternal and Child Health and Family Planning Center in Denizli State Hospital. The research sample consisted of 250 women who came for follow-up between August-October 2008, and voluntarily agreed to participate. Socio-demographic and obstetric variables were collected through a socio-demographic and obstetric questionnaire. To achieve the goals of the current study, we employed the Beck Depression Inventory (BDI).

Results: Working women's mean depression score was 27.35 ± 17.52 while non-working women's mean depression score was 21.32 ± 16.54. The BDI-based prevalence of PPD (to the cut off score of, 17) was 60.8%. As a result of the multiple regression analysis, it was determined that working women's age, delivery mode, satisfaction with the baby's sex, baby's nutritional style and health status increased the depression scores in a linear fashion. Fifty one percent of the working women's mean depression scores could be explained by these independent variables (R^2 =0.51). As a result of the multiple regression analysis, it was determined that non-working mothers' educational level, satisfaction with the baby's sex, family support, health status, relations with the spouse increased the depression scores linearly. Fifty eight percent of the variation in working mothers' mean depression scores can be explained by these independent variables (R^2 =0.58).

Conclusion: The findings of the current study revealed high BDI -based PPD prevalence in a sample of Turkish women and described a number of risk factors associated with PPD. The high prevalence found in this study indicated a need for developing new interventions for early detection and treatment of PPD.

Key words: Postpartum Depression, Risk Factors, Working Women, Non-working Women, Turkey

Introduction

The postpartum period is a unique period of time in a woman's life. It represents a major role change and appears with numerous transformations which are social, psychological as well as physical. A significant decrease in gonadal hormones is observed during this period (1). In addition, childbirth is a major social and psychological disrupter of the lives of an infant's parents (2).

Postpartum depression (PPD) is a non-psychotic depressive episode of mild to moderate severity, beginning in or extending into the first postnatal year (3). PPD is an important public health problem, having a significant impact on the mother, the family, her partner, mother–baby interaction and on the long-term emotional and cognitive development of the baby (3,4,5). Research from Western countries shows that maternal depression is related to poor bonding between mother and child, missing pediatrics appointments, missing required vaccinations, and more frequent use of emergency department services (6,7,8,9).

PPD, which typically occurs from 2 weeks to 1 year after the birth of a child, may manifest with symptoms that may not be very apparent to untrained health care workers (10,11). Depending upon how it is defined, the assessment criteria used and the geographical and cultural dimension of the study conducted, PPD prevalence is seen over a wide range of 3.5–40% (12). Cultural backgrounds were found to greatly influence prevalence and the assessment and management of PPD (13). A recent systematic

review revealed low PPD prevalence in Western Europe and Australia (13%), medium PPD prevalence in the US (29%), whereas high PPD prevalence was reported in India (32%) and South Korea (36%) (14). A meta-analysis of 59 studies (n=12810) found an average prevalence rate of non-psychotic PPD of 13% (95% CI 12.3–13.4)(15). A few studies from Turkey have found the prevalence of PPD to be high and in the range of 21.8–36.9% (16).

Midwives and nurses who provide postnatal care have significant roles in determining a postpartum woman's risk factors for psychological illness. They offer preventive care, screening to ensure early diagnosis, and direct mother with psychological problems to appropriate treatment and care. Postpartum women seek more care in this period than during other periods of their lives, and spend more time with health-care personnel (17). For this reason, postpartum is a unique opportunity to screen for depression in women, to provide preventive care, to priorities women in risk groups, and to ensure that they are sent for consultation and receive care and treatment for diagnosed illnesses.

Midwives and nurses can help prevent the development of depression in postnatal period, and mild signs of depression from worsening and illness recurring. They can also implement interventions such as stress reduction, ensuring adequate nutrition, preventing the consumption of cigarettes, nicotine and caffeine, encouraging exercise and adequate hygiene, educating women about measures that may help with adaptation (such as taking a warm sitz bath and drinking warm milk), developing coping skills and putting into action current social support systems (particularly for women who are separated or divorced) (18,19).

In the current study we aimed: (1) to report the rate of postpartum depression among Turkish women in Denizli province; (2) description of the association of PPD with risk factors. Being aware of risk factors for depression during postpartum and cultural characteristics are important in planning and implementing postnatal care.

Materials and Methods

This descriptive and cross-sectional study was conducted between August-October 2008. The population for the study included postpartum women who came to Maternal and Child Health and Family Planning Center in Denizli State Hospital, to postpartum women who came for follow-up during this period. This study was undertaken in the city of Denizli which has a geographical area of 11.868 km^2 and a total population of approximately 926.362 people. Denizli, where the source of income is agriculture and industry is located in the western part of Turkey. The research sample consisted of 250 women chosen with a convenience sampling technique. In social sciences it was stated that the ideal size has to be around 250-300 samples for a normal distribution (20). For this reason, it was seen sufficient to have 250 women to join this survey.

The socio-demographic and obstetric questionnaire

A 24-item questionnaire was specifically designed for the purpose of this study. It was formulated after a thorough review of the relevant literature. Socio-demographic and obstetric variables, such as age, education, employment, place of residence, migration, family type, economical status, conscious pregnancy, type of delivery, the period after birth (month), sex of the newborn, the baby's nutrition, the baby's health status, perception of one's own and the baby's health, family, relative and friend support for the mother's and the baby's care after the birth, self-evaluation of psychology, evaluation of the relations with the spouse were assessed through a specially designed socio-demographic and obstetric questionnaire.

After the questionnaire was prepared, it was shown to five members of the teaching staff for expert opinions regarding its validity. The majority of the questionnaire was found to have reasonable validity based on the expert reviews. Then the questionnaire was tested for understandability by giving it to 30 women who were not included in the study, and changes were made based on their recommendations.

All women who were in their 2nd–24th weeks postpartum were invited to participate in the study. Participation was on a voluntary basis. All the women participating in the study gave their informed consent. All data were collected during face-to-face interviews. Interviews including completing all measures with each woman lasted about 15–20

min. Women with twin pregnancies and those who had babies with chronic health problems were not included.

The Beck Depression Inventory (BDI)

We employed the BDI, which is a 21-item self-reporting questionnaire. The BDI was developed by Beck et al. (1979). The BDI is a specially designed and most commonly used tool to assess a woman's self-report of depressive symptomatology during the postpartum period. For each category there are 4-5 statements of increasing severity. The women reads the scale and marks the statement most applicable to herself. The score for each item ranges from 0-3; the total score falls between 0-62 (21). The BDI has been translated into many languages and has also been validated in many cultures. It is recommended in primary care. Hisli et al.(1987) translated and adopted the BDI into Turkish. The Turkish version of the BDI has been validated. Hisli et al. (1987) found a cut-off point of 17 with a sensitivity of 0.84 and specificity of 0.88 and Cronbach's alpha (internal consistency reliability) was 0.79 (22). The BDI is an easily administered, objective, reliable and valid instrument. The cut-off point of 17 was used in the study and women with the BDI scores of ≥ 17 were regarded to be at risk. The internal reliability of the BDI in our study demonstrated very good internal scale reliability with Cronbach's alpha coefficients (0.97). It is important to remember at this point that BDI is only a screening tool, even though it has high specificity and sensitivity. The actual prevalence of PPD which is diagnosed by psychiatric consultation may differ slightly.

Ethics

The approval of the institutional review board was obtained from the Regional Health Directorate and permissions to conduct the study were also obtained from administrators of Maternal and Child Health and Family Planning Center in Denizli State Hospital.

Data analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA), version 13.0. Descriptive characteristics, such as frequency and summary were calculated for variables of interest. A bivariate analysis was performed with the potential risk factors for PPD. Multiple logistic regression analysis was then performed with the risk factors with statistical significance in bivariate analysis. A level of $p<0.05$ was considered statistically significant.

Results

Socio-Demographic Characteristics of Working and Non-working Women

Among the working women, 43% were in the 20-25 age range, 38.7% had high school degree, 66.7% had not migrated, 67.7% had equivalent income and expenditure and 90.3% had a nuclear family structure.

Among the non-working women, 43.3% were in the 18-24 age range, 45.9% had graduated from the primary school, 68.2% had not migrated, 50.3% had equivalent income and expenditure and 84.7% had a nuclear family structure (Table 1).

Bio-Psychosocial Characteristics of Working and Non-working Women

It was determined that 86% of the working women got pregnant consciously, 55.9% had Cesarean section, 60.2% had delivery in a state hospital, 81.7% were "pleased" with their baby's sex, 74.2% received family support, 34.4% received support from relatives, 50.5% reported having a "fair" relationship with their husband, and 49.5% stated that their general health condition was "good" (Table 2).

It was determined that 84.1% of the non-working women had conscious pregnancy, 56.1% had normal delivery, 75.8% had delivery in a state hospital, 91.7% were "pleased" with their baby's sex, 78.3% received family support, 24.2% received support from the relatives, 44.6% had a "fair" relationship with their spouse, and 63.1% had a "good" general health status (Table 2).

Bio-Psychosocial Characteristics of Working and Non-working Women's Babies

Among the working women, 55.9% had a daughter and 51.6% breastfed their babies. Among the non-working women, 57.3% had a son and 70.1% breastfed their baby (Table 3).

Table 1. The Distribution of the Postpartum Working and Non-working Women's Characteristics

	Working Women		Non-working Women	
	n	%	n	%
Age Group				
18-24 years	29	31.2	68	43.3
25-29 years	40	43.0	49	31.2
30-34 years	24	25.8	40	25.5
Educational Level				
Elementary school	16	17.2	72	45.9
Middle School	14	15.1	33	21.0
High School	36	38.7	41	26.1
College / University	27	29.0	11	7.0
Migration Status				
Immigrants	31	33.3	50	31.8
Non-immigrants	62	66.7	107	68.2
Perception of Income				
Income Lower than Expenditure	30	32.3	78	49.7
Income equals to the Expenditure	63	67.7	79	50.3
Family Type				
Nuclear Family	84	90.3	133	84.7
Large Family	9	9.7	24	15.3
TOTAL	93	100.0	157	100.0

Table 2. Bio-Psychosocial Characteristics of Working and Non-working Women

	Working Women		Non-working Women	
	n	%	n	%
Pregnancy Type				
Conscious Pregnancy	80	86.0	132	84.1
Non-conscious Pregnancy	13	14.0	25	15.9
Mode of Delivery				
Normal Delivery	41	44.1	88	56.1
Cesarean Section	52	55.9	69	43.9
Delivery Place				
State Hospital	56	60.2	119	75.8
Private Hospital	37	39.8	38	24.2
Satisfaction with Sex				
Satisfied	76	81.7	144	91.7
Dissatisfied	17	18.3	13	8.3
Family support				
Receives support	69	74.2	123	78.3
Does not receive support	24	25.8	34	21.7
Support from the Relatives				
Receives support	32	34.4	38	24.2
Does not receive support	61	65.6	119	75.8
Relations with the Spouse				
Good	32	34.4	66	42.0
Fair	47	50.5	70	44.6
Bad	14	15.1	21	13.4
General Health Status				
Good	46	49.5	99	63.1
Moderate	31	33.3	32	20.4
Bad	16	17.2	26	16.6
TOTAL	93	100.0	157	100.0

Table 3. Bio-Psychosocial Characteristics of Working and Non-working Women's Babies

	Working Women		Non-working Women	
	n	%	n	%
Baby's Sex				
Female	52	55.9	67	42.7
Male	41	44.1	90	57.3
Nutritional Style				
Mother's milk	48	51.6	110	70.1
Mother's milk and baby food	30	32.3	25	15.9
Additional food	15	16.1	22	14.0
TOTAL	93	100.0	157	100.0

Table 4. Working and Non-working Women's Mean Depression Scores

	n	Min	Max	Mean
Working Mothers' Depression Scores	93	0.0	63.0	27.35 ± 17.52
Non-working Mothers' Depression Scores	157	0.0	63.0	21.32 ± 16.54

Working and Non-working Women's Mean Depression Scores

Working women's mean depression score was 27.35 ± 17.52 while non-working women's mean depression score was 21.32 ± 16.54. A "moderately" significant positive relationship was found between postpartum working and non-working women's mean depression scores (r=0.33 p=0.001) (Table 4).

Considering postpartum working and non-working mothers' distribution of depressive symptom levels according to the cut off score of 17, it was found that 73.1% of the working mothers were depressive, 26.9% were not depressive whereas 53.5% of the non-working mothers were depressive and 46.5% were not depressive.

The Relationship Between Working and Non-working Women's Mean Depression Scores and Socio-demographic and Bio-psychosocial Features

Working Women

As a result of the correlation analysis, it was found that there was a significant positive relationship between working women's mean depression scores and age (r=0.40 p<0.01), conscious/non-conscious pregnancy (r= 0.26 p<0.05), delivery mode (r= 0.22 p<0.05), satisfaction with the baby's sex (r=0.31 p<0.01), the baby's nutritional style (r= 0.24 p<0.05), health status (r=0.56 p<0.01), and relations with the spouse (r=0.45 p<0.01) (Table 5).

The independent variables which indicated a significant relationship with the working women's mean depression scores were analyzed by means of multiple regression analysis. It was determined that working women's age, delivery mode, satisfaction with the baby's sex, baby's nutritional style and health status increased the depression scores in a linear fashion (Table 6). The Durbin-Watson (DW) value (1.545) demonstrated that the regression model was well-constructed. The correlation between working mothers' depression scores and independent variables was (R) 0.72. Fifty one percent of the working women's mean depression scores could be explained by these independent variables (R^2 =0.51). Considering the linearity of this relationship's linearity, it was found to be significant and linear (F= 12.737 p<0.01).

Non-working Women

As a result of the correlation analysis, a significant positive relationship was found between non-working women's mean depression scores and educational level (r=0.23 p<0.01), family type (r=0.19 p<0.05), conscious/non-conscious pregnancy (r= 0.24 p<0.01), delivery mode (r= 0.22 p<0.01), satisfaction with the baby's sex (r=0.40 p<0.01), health status (r=0.65 p<0.01), and relations with the spouse (r=0.57 p<0.01) (Table 5).

The independent variables which pointed to a significant relationship with the non-working women's mean depression scores were analyzed by means of multiple regression analysis. It was determined that non-working mothers' educatio-

Table 5. The relationship between working and non-working mothers' mean depression scores and independent variables

		Age Group	Educational Level	Migration Status	Perception of Income	Family Type	Pregnancy Type	Mode of Delivery	Delivery Place	Baby's Sex	Satisfaction with Sex	Nutritional Style	Family support	Support from the Relatives	Health Status	Relations with the Spouse
Working Women's	**r**	**0.40***	0.02	-0.14	-0.12	-0.14	**0.26****	**0.22****	0.15	-0.09	**0.31***	**0.24****	0.17	-0.16	**0.56***	**0.45***
	p	0.00	0.83	0.89	0.25	0.17	0.01	0.03	0.15	0.41	0.00	0.02	0.10	0.11	0.00	0.00
Non-working Women's	**r**	-0.04	**0.23***	-0.11	-0.14	**0.19****	**0.24***	**0.22***	0.08	0.02	**0.40***	0.07	**0.29***	-0.12	**0.65***	**0.57***
	p	0.66	0.00	0.18	0.08	0.02	0.00	0.00	0.31	0.76	0.00	0.39	0.00	0.13	0.00	0.00

*$p<0.01$ **$p<0.05$

nal level, satisfaction with the baby's sex, family support, health status, relations with the spouse increased the depression scores linearly (Table 6). The Durbin-Watson (DW) value (1.551) demonstrated that the regression model was well-constructed. The correlation between working mothers' depression scores and independent variables was (R) 0.76. Fifty eight percent of the variation in working mothers' mean depression scores can be explained by these independent variables (R^2 =0.58). Considering the linearity of this relationship, it was found to be significant and linear (F=25.505 $p<0.01$). It is observed that satisfaction with the baby's health and women's health status influenced both working and non-working mothers' depression scores (Table 5, Table 6).

Table 6. Regression model for working and non-working mothers' mean depression scores and independent variables

Working Women	**Beta**	**t**	**p**
Age Group	0.248	2.992	0.004
Pregnancy Type	0.033	0.378	0.706
Mode of Delivery	0.234	3.038	0.003
Satisfaction with the baby's sex	0.173	2.158	0.034
Baby's nutrition style	0.185	2.313	0.023
Health status	0.322	3.217	0.002
Relations with the spouse	0.153	1.634	0.106
R=0.72 R^2 =0.51 Durbin Watson= 1.545 F=12.737 p=0.000			
Non-working Women	**Beta**	**t**	**p**
Educational Level	0.145	2.595	0.010
Family Type	0.073	1.301	0.195
Pregnancy Type	-0.042	-0.710	0.479
Mode of Delivery	-0.007	-0.116	0.908
Satisfaction with the baby's sex	0.130	2.163	0.032
Family support	0.111	1.973	0.050
Health status	0.429	6.595	0.000
Relations with the spouse	0.319	5.211	0.000
R=0.76 R^2 =0.58 Durbin Watson= 1.551 F=25.505 p=0.000			

Discussion

In the present research, it was documented that 60.8% of women had PPD at a level that required professional help according to the cut off point (17) accepted for Turkey. Depending upon how it is defined, the assessment criteria used and the geographical and cultural dimension of the study conducted,

PPD prevalence is seen over a wide range of 3.5–40% (12). In this study BDI-based PPD prevalence for Turkey was found to be higher than previous studies (16,23,24). For this reason, it is important to know the risk factors associated with PPD.

According to BDI's cut-off point (17) for Turkey 73.1% of the working women and 53.5% of the non-working women had PPD at a level which necessitated professional help. Furthermore, working women's mean PPD scores (27.35 ± 17.52) were found to be higher than that of non-working women (21.32±16.54) (r=0.33 p=0.001). Despite the egalitarian structure of the laws in Turkey, women face various problems in terms of showing their full potential in employment, continuing their profession or getting promotion. Since professions were classified and socially accepted as "female jobs" and "male jobs", women can only focus on traditional female occupations and consent to working at lower status and salary jobs. These jobs bring about the issues of seasonal and temporary work and social insecurity. Those women who can enter professional life cannot work to their full potential due to their responsibility for children, the elderly and patients and have to leave the work life. Social support institutions, such as nursery and kindergarten which are needed for solving the problems of family-work life integration, have not reached a satisfactory number in Turkey (25). The fact that women continue their mother and spouse roles as well as starting the work life leads them to experience more role conflicts. It is thought that these factors lead to more PPD among working women.

In the present research, the multiple regression results revealed a significant relationship between working women's age, delivery mode, satisfaction with the baby's sex, feeding the baby, health status and PPD scores. The multiple regression scores also revealed a significant relationship between non-working women's educational level, satisfaction with the baby's sex, family support, health status, relations with the spouse and PPD scores. It has been observed that satisfaction with the baby's sex and women's health status influence PPD scores among both working and non-working mothers.

In the studies on explaining the etiology of depression, a certain risk factor is not singled out for the emergence of the disorder; the negative interaction between the genetic structure and environment as well its timing is found to be significant. Familial responsibility, depressive personal characteristics, being female, low educational level, negative life events, lack of close relationships, physical disorders and their treatment, psychiatric disorders leading to loss of ability are considered as basic risk factors for depression (26,27,28).

Three major meta-analytic studies have been conducted revealing a number of risk factors strongly associated with PPD: a history of depression, antenatal depression, antenatal anxiety, stressful life events, negative cognitive attributional style, low self-esteem, childcare stress, low social support and low income (29,30,31). Other risk factors for PPD cited in the literature include young age (32), fewer years of education (33), a history of miscarriage and pregnancy termination, (34) a history of childhood sexual abuse (35), birth experience, prenatal and postnatal care (36) and conscious or non-conscious pregnancy (37). Several researchers have demonstrated an association between quality and/or satisfaction with the marital or equivalent relationship and PPD(31,38, 39,40,41). A few researchers have specifically assessed the relationship between partner conflict and PPD. In an Australian study, where 490 women completed questionnaires postnatally, 'arguments with a partner' was a significant risk factor for PPD at 8 weeks (42). Similarly, in a prospective study, following a community-based cohort of 288 Israeli women, 'marital disharmony' was significantly related to PPD(43). In the present study, it was found that working and non-working mothers' PPD levels were influenced by the woman's age, educational level, delivery mode, health status, family support, and relations with the spouse. These results are compatible with the previous literature.

The hormonal changes in the postpartum breastfeeding period were found to be significant in the emergence of psychiatric disorders, especially in PPD (44). In this study, the fact that the mother's feeding style is influential over PPD levels is one of the most important indicators of the importance traditionally allotted to breastfeeding in motherhood. Work life does not allow breastfeeding whenever the mother needs and thereby creates problems for mothers. Mothers may view their work life as a hindrance concerning their babies' nutrition. Misri et al. (2006) determined that in 83% of the women with PPD who stopped producing milk, PPD star-

ted after the milk ran out. The findings of Misri lend support to this view (45).

In contrast to the previous literature, the multiple regression results in the present study pointed to the fact that satisfaction with the baby's sex influenced PPD rates. According to a study by Kağıtçıbaşı (2003) the preference for male babies, which was 84% in the 1970s dropped to 41% in the 2000s (46). However, the preference for male babies is still dominant in Turkey due to viewing the child as a security for old age and other financial benefits, and traditionally the male child is valued more. Studies conducted in the east demonstrated a relationship between having a female baby and dissatisfaction with the baby's sex (47, 48, 49). Due to the traditionally attached value to the baby's sex, it is natural that a woman's psychology may be influenced when she does not give birth to a baby of the desired sex. This result could be interpreted as a negative outcome of the pressure to give birth to a male child in Turkish society.

Conclusion

The findings of the current study revealed BDI –based PPD prevalence in a sample of Turkish women and described a number of risk factors associated with PPD. The prevalence found in this study indicated a national need for developing new interventions for early detection and treatment of PPD. Health care workers are in key position. Health care professionals should be skilled in monitoring risk factors associated with PPD and in identifying women with increased risk for PPD, such as women's age, educational level, employment status, delivery mode, satisfaction with the baby's sex, feeding the baby, health status, family support and relations with the spouse.

Limitations

Since the participants were not asked whether they had depression before or not, a limitation emerged in interpreting the PPD result. At the same time, due to the fact that it was carried out in only one city center and the sample size was small, the result cannot be generalized. However, the results will inform future studies since it is a follow-up study on PPD among working and non-working women in Turkey.

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The Effects of Supplemental Iron on Educational Achievements of Students with "Iron Deficiency without Anemia": A Randomized, Double-Blind, Placebo-Controlled Trial

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Abstract

Background: Iron deficiency without anemia is highly prevalent among female university students.

Objective: Considering the intense competition for future educational opportunities and the possible impacts of iron deficiency on brain activities, we tried to investigate the effects of supplemental iron on educational achievements of students with iron deficiency without anemia entering universities.

Methods: The iron status was evaluated in 209 female students at Faculty of Science, University of Isfahan. Iron deficiency without anemia was detected in 40.46% of the cases of which 72 individuals entered the clinical trial. The subjects were divided into two groups of 36 and treated with iron supplements or placebo. Afterwards, their educational progress was assessed.

Results: Students who received supplemental iron showed more improved educational rankings ($p = 0.05$) and average scores ($p = 0.009$) compared to the control group.

Conclusion: The findings of this study indicated the positive effects of iron supplementation on the educational achievements of female students suffering iron deficiency without anemia.

Key words: Iron Deficiency without Anemia, Adult Female, Academic Achievements, Supplemental Iron.

Introduction

Iron deficiency is the most common nutritional disorder worldwide which is particularly prevalent among adult females (1). While 8.7% of Iranian young female students (including university students) were reported to suffer from iron deficiency anemia(IDA)(2), less severe cases ,iron deficiency without anemia(IDWA) , were found to be three times more prevalent, with some studies even reporting it as 40%(3-5). Available evidences indicate that IDA affects brain activities such as concentration and learning ability, not only during infancy but also throughout the life course(1, 6-8). The effects of IDWA during reproductive ages have recently attracted vast attention(4). In communities of low economic status, nutritional problems make iron deficiency more common(9). On the other hand, academic achievements and level of education influence a family's economic level resulting in a vicious circle.

Although there is no doubt about the importance of IDA and the necessity of treating this deficiency, IDWA, with no specific clinical symptoms may remain underestimated. Considering the high prevalence of iron deficiency (with and without anemia) among female university students, and the possible effect of iron levels on brain activity, the current study is designed to evaluate the efficacy and beneficial effect of supplemental iron on the educational progress of students with IDWA. This project might be the first step for a comprehensive plan regarding the diagnosis and treatment of students with IDWA who enter the universities.

* Moafi and Rahgozar have equal contribution to the manuscript

Methods

Randomized double-blind clinical trial was performed on all female students in Faculty of Science, University of Isfahan, at the beginning of the second semester of 2009-2010. This research was permitted and approved by ethic committee of Isfahan University of medical sciences (protocol number 189073). After the students signed written informed consents, they were tested for anemia and iron deficiency. Minimum normal levels of hemoglobin and ferritin were considered as 12 g/dl and 20 ng/dl, respectively(3, 10). The participants were examined and asked about having a history of any acute or chronic disease. Then, a 3 cc ethylene diamine tetraacetic acid (EDTA) and a 2 cc coagulated blood sample were taken to determine hemoglobin and ferritin concentrations based on which the students were divided into three groups. Hemoglobin and serum ferritin levels were determined by Sysmex XE 2100 analyzer and Liaison chemiluminescent immunoassay (DiaSorin, Italy), respectively. The first group included healthy subjects with normal hemoglobin and ferritin levels. Students with low hemoglobin (< 12 g/dl) were considered as patients, directly were referred to a hematologist and were excluded from the study. Individuals suffering IDWA, i.e. having normal hemoglobin but low ferritin (< 20 ng/dl), were included and divided into two groups of control and case after obtaining a second informed consent.

While the case group was treated with iron sulfate pills containing 50 mg of elemental iron twice a day for 6 weeks, the control group received placebo (prepared at School of Pharmacy, Isfahan University of Medical Sciences) with the same schedule. All the researchers, except the principle investigators, were blinded to the grouping. The participants were provided with 28-pill packs labeled with their names. Every two weeks, the amount of medicine consumed was asked and side effects, complications and special events such as marriage, pregnancy, loss of a loved person and other physical or mental problems were evaluated. After recording this information, next packs were supplied to each participant. The study was started on April 9, 2011 and continued for 6 weeks. Individuals who could not take the medicine or who had particular problems were excluded. Following the final exams, students' scores and rankings were extracted in 2 semesters, before and after intervention, by the University of Isfahan School of Education. Data were analyzed using GraphPad Prism software, version 3.03 (GraphPad Software, San Diego, CA).

Statistical analysis

Data were expressed as the mean±SD . Differences between groups were evaluated by using Student's t-test and one-way unpaired analysis of variance (Mann-Whitney comparison test).

Results

The study population included 209 female university students majoring Biology (Genetics, Microbiology, and Botany) at Faculty of Science, University of Isfahan, during the educational year of 2010-2011. IDWA, i.e. hemoglobin > 12 g/dl and ferritin < 20 ng/dl, was observed in 85 (40.6%) individuals. Of which 72 accepted and signed informed consents forms. Computerized randomization was used to allocate these students into the two groups of 36. The case and control groups were not significantly different in terms of age or level of ferritin (Table 1).Twenty eight students were referred to a hematologist due to anemia.

One student in the case group was excluded due to iron intolerance. Gastrointestinal complaints including nausea (n=5), constipation (n=2), stomachache (n=1), diarrhea (n=1), and increased appetite (n=1) were reported by 8 subjects in the case group and 2 in the control group. Three 6-week treatment courses (with 86 iron pills or placebo) were completed by 32 subjects in the case and 33 in the con-

Table 1. The age and ferritin levels in two groups before the intervention

P-value	Control		Case		
	(Min, Max)	Mean (SD)	(Min, Max)	Mean (SD)	
0.84	(18, 26)	**20.7** (1.68)	(18, 23)	**20** (1.18)	**Age** (years)
0.13	(5, 17.30)	**12.1** (4.02)	(4.70, 17.40)	**10.61** (4.11)	**Ferritin level** (ng/dl)

Table 2. Comparison between the number of credits and average scores of case (32 people) and control (33people) groups before and after the intervention

P-value	After intervention		Before intervention			
	(Min, Max)	Mean (SD)	(Min, Max)	Mean (SD)		
0.049	(12, 13)	**17.9** (2.2)	(12, 21)	**17.1** (2.4)	Case	Number of credits
0.770	(13, 20)	**17.4** (1.9)	(12, 20)	**17.3** (2.1)	Placebo	
0.009	(12.28, 18.57)	**15.55**(1.7)	(11.76, 18.10)	**14.99** (1.6)	Case	Average scores
0.880	(12.52, 18.80)	**15.57**(1.5)	(12.58, 17.91)	**15.44** (1.6)	Placebo	

Table 3. Comparison of rank variation between the case and placebo groups after the intervention

	Case n(%)	Placebo n(%)	Total n(%)
Decrease in ranks	**12**(37.5)	**14**(42.4)	**26**(40)
No change	**2**(6.3)	**6**(18.8)	**8**(12.3)
1 rank increased	**2**(6.3)	**4**(12.1)	**6**(9.2)
2-4 ranks increased	**5**(15.6)	**5**(15.1)	**10**(15.3)
≥ 5 ranks increased	**11**(34.4)	**4**(12.1)	**15**(23)
Total	**32(100.0)**	**33(100.0)**	**65(100.0)**

trol group. Two weeks following the last pill, ferritin levels were 22.39±15.10 and 15.39±1.57 for the case and control groups, respectively.

Average scores of the case group increased after intervention (table 2). In the case group, mean average scores before and after intervention were 14.49±1.6 and 15.55±1.7, respectively (Mean±SD, p=0.009).However, in the control group, mean average scores didn't show significant changes before and after intervention (15.44±1.6 vs. 15.57± 1.7) (Mean±SD, p=0.880). The Mann Whitney test showed that the ranks of participants in the case group were increased after the intervention (p=0.05) compared with those in control group which did not show significant variations in ranks (p>0.05) (table 3).

Discussion

Iron is an essential element in human body, the lack of which is not limited to anemia. Permanent effects of IDA on brain activities and IQs of infants and children remain uncured even after the disorder is treated(11-13). However; these complications are not limited to the infancy. Based on available evidences, IDA may lead to neuropsychological problems (although treatable) in older ages (14, 15). Cognitive performance, emotions, and behavior May be affected in this regard. However, controversy exists regarding the effects of IDWA on mental activities. Some researchers did not find any iron deficiency-related symptoms in patients suffering from IDWA(16), while others reported improved brain activities or physical status as a result of supplemental iron intake (4, 17, 18). Our results showed a significant difference between the case and control groups in terms of ranking improvement and the increased average scores. These data confirm the effect of IDWA in mental activities. On the other hand, the current study evaluated, for the first time, the effect of iron intervention on the "educational achievements" as an indicator of brain activities. This variant may be directly or indirectly associated with cognitive performance including concentration and attention, or behavior and emotions, respectively.

The current study showed that the effect of iron storage depletion on educational achievements is transient and may be reversed. However, if treatment is initiated late in life, the deficiency may cause long lasting consequences. The important message of this study is to show that iron intervention may easily promote students' academic scores and rankings; an important factor which may eventually affect their social, economical and interpersonal quality of life. Authors want to highlight the importance of early diagnosis and treatment of iron deficiency, the strategy which may effectively improve the life style of the young generation and subsequently the whole nation. This issue is more

important in developing countries, where iron deficiency (with and without anemia) is more prevalent(19). As a supportive program for low income people, we recommend that health strategies focus on early identification and treatment of this disorder in families which nutritional problem is frequent.

The serum ferritin cut off point used for initiating interventions addressing iron deficiency is not clearly indicated among different studies. In this project the students with ferritin concentrations lower than 20 ng/ dl (and hemoglobin > 12 g/dl) were considered IDWA, and a particular academic improvement is proved as a result of correcting the disorder. Krayenbuehl et al considered serum ferritin of < 15 ng/dl more indicative than >15 ng/ dl for initiating the treatment of fatigue in non-anemic, premenopausal women(20). In this study, only 6 out of 32 participants who completed the iron supplement course had ferritin levels equal to or higher than 15 ng/dl from which 50% got higher scores after taking iron supplements. On the other hand, 66% of students with ferritin < 15 ng/dl showed improved educational achievements after intervention. However, the difference between the aforementioned two groups was not significant, suggesting a ferritin concentration of 20 ng/dl as appropriate cut-off to initiate an intervention as mentioned in text books references(3).

Considering the high prevalence of iron deficiency in women, we studied a population of female adult students. Different figures were reported for the prevalence of iron deficiency (with or without anemia) in various parts of the world depending on economic status, culture, and social habits(3). Our findings on the prevalence of IDWA (40.6%) among the studied population were not far from our expectations. Moreover, since in this study, iron supplementation has been proved to be effective in promoting students' academic status, identification and treatment of the disorder (maybe as a health program when the students enter the university) are of utmost importance.

Although 56% of the participants achieved better rankings after intervention, 37.5% ranked worse. Changes in ranking could result from different factors such as probable personal and social problems, environmental issues, interest in the studied subject, and emotional concerns. Therefore, despite the fact that we included pleasant or unpleasant events (e.g. marriage, pregnancy, loss of a loved one, etc.) in our study, the abovementioned underlying factors (possibly with lower severity) could still influence rankings, especially due to our lack of knowledge about each individual's private life. However, designing the study as a randomized double blind clinical trial with two identical groups minimized the effects of underlying factors, making the result more reliable.

Conclusion

Supplemental iron led to improved academic achievements in university students suffering IDWA. Iron deficiency is highly prevalent, and negatively influences the educational achievements and future opportunities of students. Hence, iron deficiency among university students, especially those of low economic status, needs to be prevented and early treated in order to provide better educational circumstances for economically troubled students.

Acknowledgments

This study was registered in Isfahan University of Medical Sciences (Number 189073) and Iranian Registry of Clinical Trials (a primary registry of the World Health Organization) (Project No. IRCT201008254630N1). The authors sincerely thank all the authorities and students of the University of Isfahan for their kind cooperation.

Authors' Contributions

Study design. Drs Moafi and Rahgozar

Acquisition of data. Dr Moafi, Dr. Rahgozar, Dr. Ghias, Mrs Hajian and Ghorbani.

Analysis and interpretation of data. Drs Moafi and Rahgozar.

Manuscript preparation. Drs Moafi and Rahgozar.

Statistical analysis. Dr Moafi and Mr Hassanzadeh.

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Effects of facet joint nerve block addition to radiofrequency in the treatment of low back pain

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Abstract

Objective: We aimed to compare the effects of radiofrequency, local anesthetic and steroid injection and combination of them for facet syndrome that is a reason of low back pain.

Summary of Background Data: Basically, radiofrequency thermocoagulation is a procedure that causes tissue damage like nerves by exposing the tissue to heated electrode tip. Nerve blocking has been used as an effective pain therapy method. So we tried to compare and combine these two methods in the treatment of lumbar facet syndrome.

Methods: Patients were randomly divided into 3 groups (n=40) each consisted of 40 individuals. Local anesthesia was applied after determining the injection area by c-arm scope device. Radiofrequency was applied in Group R, a mixture of 20 mg metilprednisolone and 5 mg bupivacain was administered in Group B and combination of all these was applied in Group RB. VAS, activity and satisfaction scores were recorded before and after the procedure.

Results: In Group R and Group RB, VAS and activity scores were similar except day 1, day 2 and week 1 and better than group B. Satisfaction scores of Group B were lower when compared to Group R and RB. However, satisfaction scores of Group RB were higher than those of Group R in day 1, day 2 and week 1 but there was no difference at later time points.

Conclusion: In conclusion, we suggest that successful results can be obtained with radiofrequency thermocoagulation plus facet nerve block combination therapy in patients having lumbar facet syndrome.

Key words: low back pain, radiofrequency, nerve block, zygoapophyseal joint

Introduction

Low back pain is one of the most important disorders affecting human life. Approximately 70-90% of people have low back pain at some point of their lives. In recent years, although the importance given to low back pain has increased, etiology of most of the low back pain cases still remains unclear. It has been reported that 80% of the cases having low back pain have idiopathic low back pain (1). Facet joints are one of the most important sources of low back pain and leg pain. In contrast to sciatalgia occurring due to disc hernia, resting does not have any help in facet joint syndrome. If it is not accompanied by discopathy, there is generally no neurologic finding. Radiological evaluation is usually not helpful in the diagnosis of the said disorder (1-3). Many studies have stated the inadequacy in diagnosing facet joint pain with the help of history, physical examination and radiologic findings and concluded that an analgesic response to intraarticular medial branch or facet nerve block is the only certain method to identify facet joint pain. These studies have also concluded that this could be a treatment method to reduce pain (4-6). In many studies, it has been shown that radiofrequency applications are effective in the treatment of facet syndrome (7-10). The principle of radiofrequency thermocoagulation application is to damage the facet nerve by the heat delivered through an electrode. In the first studies carried out on this issue, it was suggested that a lesion created by this method had a selective effect on C and A-delta fibers. However, later, it was shown that the said application affected both thin and thick fibers equally and provided analgesia (11).

In the present study, our aim was to compare efficiencies of pulse radiofrequency thermocoagulation, facet nerve block and their combination in the treatment of facet syndrome which is a common reason of low back pain.

Materials and method

After getting informed consent from patients and local ethical committee, our study was conducted on individuals having single sided low back pain arising from facet joint, lasting more than 6 months and limiting functions and daily life. 120 patients divided into 3 groups each containing 40 individuals were included in this randomized double blinded study with an α value of 0,05, 1-β of 0,83 and power value of 0,83585. After obtaining history for all the patients and conducting clinical, neurological and radiological evaluations, patients aged between 18-60 and diagnosed with single sided facet syndrome and having no prior interventional treatments were included in the study. The patients troubling at least 2 of the 4 symptoms of facet syndrome, which are; back pain aggravation by hyperextension and rotation, morning stiffness or pain increasing in the morning, local tenderness over one or more facet joints and hip and buttock pain of a nonradicular distribution were enrolled in our study. Informed consent was obtained prior to the procedure. Patients not accepting the procedure, not giving their consent, having coagulation defect, major depression and uncontrolled psychiatric disorder, being pregnant or at lactation, having respiratory or cardiac problems in prone position, receiving opioid treatment during the previous 1 month, undergoing surgical procedure at the same site, having infection at the procedure site and having disc-related radicular symptoms were excluded from the study.

Using envelope technique, patients were divided into 3 groups each composed of 40 individuals (n=40). All the patients were taken to the surgery room, monitorization was done and injection area was cleaned by antiseptic solution. After C-arm scope guided detection of injection point, 2% Prilocaine (Priloc 2%, Astra Zeneca, Turkey) was injected for cutaneous and subcutaneous anesthesia. In Group R (radiofrequency), localization of radiofrequency electrode in the facet joint causing pain was determined by sensorial stimulus and C-armed scope device. Pulse radiofrequency thermocoagulation was applied for 6 minutes at 40° C with radiofrequency lesion generator (NeuroTherm NT1000, Morgan Automation Ltd, Hampshire, UK). In Group B (block) patients, after C-arm scope guided determination of injection point, a 1.5 ml mixture of 20 mg methylprednisolone acetate (Depo-Medrol 40 mg flk, Eczacibasi, Turkey) and 5 mg bupivacaine (Marcaine 5 mg flk, Astra Zeneca, Turkey) was injected to the facet joint. In Group RB (radiofrequency and block) patients, localization of electrode in the facet joint causing pain was determined by sensorial stimulus and scope device. Pulse radiofrequency thermocoagulation was applied for 6 minutes at 40°C and a 1.5 ml mixture of 20 mg methylprednisolone acetate and 5 mg bupivacaine was injected to the facet joint at the same localization. All procedure was taken by the same physician.

Data on age, height, weight, gender and duration of pain, systolic arterial pressure (SAP) before and after procedure, diastolic arterial pressure (DAP) and heart rates (HR) were recorded for all the patients. Visual analogue scale (VAS) pain scores, daily activities (1: poor, to 4: very good) and satisfaction scores (1:poor, to 4:excellent) was recorded before the procedure and at the day 1, day 2, week 1, week 2, month 1, month, 6 and month 12 following the procedure.

Data obtained in our study were loaded on SPSS (version 14.0) and oneway Anova, Kruskal-Wallis and Mann-Whitney U tests were used for the analysis. Variance analysis (intergroup variances), Tukey test and Chi-square test were used for repeated measures.

Results

No complications were observed in the patients. There was no difference among the groups in terms of demographic data such as age, height, weight, gender and duration of pain (Table 1). When the groups were compared for SAP, DAP and HR values, there was no statistical difference.

When the groups were evaluated in terms of baseline VAS values recorded before treatment, all the measures in Group R and Group RB were found to be lower than the baseline values ($p<0.05$). In Group B, values, except those obtained at a later stage namely at month 6 and 12, were found to be lower compared to those at baseline ($p<0.05$).

When the groups were compared two by two in terms of VAS pain scores, all VAS pain scores were significantly lower in Group R and Group

Table 1. Demographic data

		Group R (n=40)	Group B (n=40)	Group RB (n=40)
Age (year)	Mean±SD	50.20±12.07	50.13±12.30	51.23±11.90
Height (cm)	Mean±SD	165.73±7.51	167.03±6.08	165.53±6.56
Weight (kg)	Mean±SD	76.06±9.29	79.00±10.17	74.80±11.37
Gender	Male/Female	14/16	13/17	13/17
Duration of Pain (months)	Mean±SD	10.67±5.22	11.31±5.05	11.02±4.96

Table 2. VAS values of the groups

	Group R (n=40) Mean±SD	Group B (n=40) Mean±SD	Group RB (n=40) Mean±SD
VAS Baseline	7.20±0.99	7.10±0.95	7.26±0.98
VAS Day 1	4.13±1.35[a]	5.43±1.22	2.03±0.92[b, c]
VAS Day 2	4.06±1.22[a]	5.43±1.21	2.13±1.01[b, c]
VAS Week 1	3.90±1.09[a]	5.33±1.22	2.26±0.81[b, c]
VAS Week 2	3.20±0.84[a]	5.16±1.26	2.93±0.96[b]
VAS Month 1	2.90±0.79[a]	5.36±1.24	3.06±1.41[b]
VAS Month 6	2.97±0.72[a]	6.46±1.21	2.96±1.21[b]
VAS Month 12	3.94±1.25[a]	7.03±1.22	3.90±1.11[b]

[a] *P < 0.05 when Group R and Group B are compared*
[b] *P < 0.05 when Group RB and Group B are compared*
[c] *P < 0.05 when Group RB and Group R are compared*

Table 3. Activity scores of the groups

	Group R (n=40) Mean±SD	Group B (n=40) Mean±SD	Group RB (n=40) Mean±SD
Activity Baseline	2.30±0.70	2.60±0.62	2.26±0.63
Activity Day 1	3.73±0.58[a]	2.66±0.66	3.70±0.45[b]
Activity Day 2	3.76±0.50[a]	2.86±0.77	3.73±0.55[b]
Activity Week 1	3.43±0.56[a]	2.86±0.66	3.16±0.87[b]
Activity Week 2	3.56±0.50[a]	2.86±0.43	3.43±0.66[b]
Activity Month 1	3.63±0.49[a]	2.60±0.45	3.43±0.56[b]
Activity Month 6	3.70±0.46[a]	2.86±0.43	3.56±0.64[b]
Activity Month 12	3.20±0.52[a]	2.66±0.71	3.16±0.66[b]

[a] *P < 0.05 when Group R and Grup B are compared*
[b] *P < 0.05 when Group RB and Group B are compared*

Table 4. Patient satisfaction scores of the groups

	Group R (n=40) Mean±SD	Group B (n=40) Mean±SD	Group RB (n=40) Mean±SD
Satisfaction Day 1	2.66±0.99[a]	1.96±0.66	3.73±0.58[b, c]
Satisfaction Day 2	2.96±0.71	2.16±0.79	3.73±0.46[b, c]
Satisfaction Week 1	2.96±0.76	2.80±0.66	3.70±0.64[b, c]
Satisfaction Week 2	3.46±0.68[a]	2.73±0.63	3.46±0.43[b]
Satisfaction Month 1	3.16±0.59[a]	2.60±0.62	3.23±0.85[b]
Satisfaction Month 6	3.53±0.68[a]	2.70±0.59	3.23±0.85[b]
Satisfaction Month 12	3.23±0.68[a]	2.70±0.59	3.13±0.85[b]

[a] *P < 0.05 when Group R and Group B are compared*
[b] *P < 0.05 when Group RB and Group B are compared*
[c] *P < 0.05 when Group RB and Group R are compared*

RB when compared to Group B ($p<0.05$). In Group RB, early VAS values, obtained at day 1, day 2 and week 1, were higher compared to Group R ($p<0.05$) (Table 2).

When groups were compared in terms of activity values, all the values were higher in Group R and Group RB when compared to Group B ($p<0.05$). There was no difference between Group R and Group RB in terms of activity score (Table 3).

In terms of patient satisfaction values, all the values except those obtained at day 2 and week 1 were higher in Group R when compared to Group B ($p<0.05$). In Group RB, early satisfaction values, namely those obtained at day 1, day 2 and week 1 were higher compared to Group R ($p<0.05$). In Group RB, all satisfaction values except at day 2 and week 1 were higher compared to Group B ($p<0.05$) (Table 4).

Discussion

This randomized, double-blind, controlled trial enrolled 120 patients with chronic low back pain due to facet syndrome and differs from other studies as it is a study comparing radiofrequency technique, local anesthetic-steroid injection and combination of two in the treatment of lumbar facet syndromes.

Intra-articular injections and medial branch blocks were reported to be equally effective in diagnosing facet joint pain and the second one involves anesthetization of the nerves to be lesioned (12). Due to sedation, superficial local anesthesia, the spread of anesthetic to other pain generating structures such as muscle, fascia, ligaments, and sacroiliac joints, diagnostic blocks are reported to have an unacceptable high false positive rate unaffected by the type of block used (6). Diagnostic blocks are not safer and less invasive than medial branch neurotomy. Therefore, we thought that using multiple blocks would increase the complication risk and distress our patients and unfortunately would not give any supplemental information. The patients troubling at least 2 of the 4 symptoms of facet syndrome, which are; back pain increasing with hyperextension and rotation, morning stiffness or pain increasing in the morning, local tenderness over one or more facet joints and hip and buttock pain of a nonradicular distribution were enrolled in our study. Similarly, Yilmaz et al. (13) did not prefer diagnostic blocks in their study and they include the patients who had facet syndrome clinical symptoms as mentioned above.

Although a decrease was observed in pain scores compared to baseline in all groups, we obtained similar and the best results in the groups where only radiofrequency was performed and injection plus radiography was performed. In a study of Dreyfuss et al. (7), results obtained up to 12 months in lumbar facet syndrome treatment with radiofrequency technique were studied, and, similar to our study, it was shown that pain scores and patient satisfaction in long term were better than the values obtained prior to the treatment. Yilmaz et al. (13) studied radiofrequency facet joint neurotomy in treatment of facet syndrome and found lower VAS values than baseline values after treatment. In a placebo-controlled study, Leclaire et al. (8) reported that VAS values obtained by radiofrequency technique after 4 weeks had been below those obtained at baseline and values obtained at week 12 had been below baseline values even if they were not as low as those obtained at week 4. Cho et al. (9) applied radiofrequency technique in 324 patients some of whom had undergone spinal surgery and stated that a decrease had been observed in low back pain in all the patients after treatment. Similarly, in a study on 60 patients having low back pain, Gallagher et al. (10) reported that radiofrequency treatment had reduced pain scores in long term.

Daily activities of patients were scored between 1 (poor) and 4 (very good) in our study. Results obtained in radiofrequency group and radiofrequency and injection combination group were similar and activity scores up to 12 weeks were similar when compared to only injection group (7). Activities were observed to improve in the studies conducted by Cho et al (9) too. Unlike in other studies, no difference was observed in terms of activity scores between radiofrequency group and placebo group the study of Leclaire et al. (8).

In our study, patients satisfaction was scored between 1 (poor) and 4 (excellent) and satisfaction scores of the group treated with radiofrequency and injection in combination were found to be higher than those of other groups in the first 2 days and week 1. We obtained better scores especially in the radiofrequency plus injection group, which

could be associated with the potentialization of local anesthetic and steroid injection. In contrast to our study, no change was observed in patient satisfaction values in the study of Dreyfuss (7).

No complications were observed in our patients, and Dreyfuss (7), Cho (9) and Yilmaz (13) similarly stated that no complications had been observed.

In conclusion, we believe that radiofrequency thermocoagulation technique is superior to facet nerve block in the treatment of lumbar facet syndrome if performed under good imaging conditions at the right areas. Facet nerve block with local anesthetic and steroid couldn't be an alternative to the radiofrequency for lumbar facet syndrome. We think that adding facet nerve block to radiofrequency thermocoagulation process in the treatment of facet syndrome would yield more rapid and effective results in terms of patient pain and satisfaction scores.

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Physical, financial unmet needs and coping in cancer patients

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Abstract

Introduction: Coping is related to health outcomes such as distress, survival and cancer recurrence. Physical problems are increased with cancer diagnosis and despite of insurance support, patients and their family burden high costs of treatment.

Objective: The purpose of this study was to investigate the physical and financial unmet needs associated with coping strategies in cancer patients.

Method: 146 patients with cancer were non-randomly selected from patients admitted for cancer treatment in Imam Khomeini Institute Cancer in 2009. Two questionnaires (physical & financial unmet need, 54-item Coping questionnaires) were completed.

Result: the most frequent of subjects were women (75.5%), married (72.3%), Muslim (95.5%) and up to 36.6% subjects had cancer with grade II. Regression analysis revealed that there wasn't any association between financial unmet need and coping, physical unmet need was associated with "Distance" coping strategy ($p<0.043$). Chi2 analysis revealed that there was association between financial unmet need and chemotherapy ($p<0.031$), physical unmet need was associated with surgery ($p<0.027$).

Conclusion: The findings suggest that Health care professional should be aware of patient's physical and financial unmet needs during their care. Further research is recommended to identify family member of cancer patient's financial need and concerns about out- of- pocket costs.

Key words: financial unmet need, physical unmet need, coping, cancer

Introduction

Disease is process that can make needs and increase some previous needs, because of its influence on body and psyche.[1,2] Newest statistics of cancer's patient death is available to following progress cancer, but there are a few clinical givens. It is clear that adequate following need to attend to psychosocial outcomes that experienced patient after malady, because malady terms and methods of treatment can influence on all personal life's dimension for a noticeable amount of times.[3] If we want to give complete care to cancer's patient, it's important to investigate surveillance-supportive and hygienic needs.[4] Cancer make noticeable effect on different patient's needs for instance emotion needs, physical needs(because of disability and infirmity) and financial needs(because of expensive treatment).[1,2] Unmet needs means there are some essential, useful and desirous acts or sources for reach to serendipity.[5] Previous studies in course of cancer patient's needs explain that cancer patients have great unmet needs and concept of these needs related with emotional and psychological status[4,5,6,7].

Previous studies on cancer patients unmet needs show that cancer patients experience high levels of unmet needs about hygienic information particularly related to methods of diagnosis and treatment, supportive psycho-social anxiety and physical needs and daily life.[8] Unmet needs can have negative influence on different personal psycho-social dimension that one of them is coping. Coping is a process that person tries to solve personal and intrapersonal problems so get eminency and decrease stresses and conflictions or can be patient. In two recent decades, increasing consideration to the physical problems related to cancer diagnosis. Coping was studied in patient with different kind of cancer, almost in patient with breast cancer, and coping related to stress, survival, reversion and further return.[1,2]

It's necessary and useful to reach psychological, physical and positive coping for coming back to the prior activity.[9] Drugest et al in 2005 acce-

ssing about relationship between demographic scales, social support, anxiety and coping in breast cancer patient, and consequence social support and demographic scales influence on coping and recovery and so coping related to education and personalcoherency.[10] Non-employment, educational stage, be single or married or divorced is related with decreasing coping and anxiety.[10] Other basic problem to unmet primary needs is because of increasing in physical problems and because of relationship between (financial, physical and …) needs and coping,[11]so if needs don't compliance maybe influence on coping and with attention to didn't have any study about physical and financial unmet needs and coping in cancer patient in Iran and universe until now, accomplishment this study, firstly redound to identity financial and physical unmet needs in Iran, and secondly identity these needs give useful information to health executors and politics to avoiding these needs, third by discover relationship between these needs and coping, by solving special needs can expect better and more positive coping. Goal of this study is responding to these questions:

1. Are there any correlation between financial unmet needs and coping?
2. Are there any correlation between physical unmet needs and coping?

Material and Method

This is a cross sectional study that 146 cancer patient admitted in Imam Khomeini Institute Cancer correlated with Tehran University Of Medicine in 2009, were selected by non-randomly sampling. These were scales of study: 1.Diagnosed cancer's pathology. 2.Doesn't have previous psychological history. 3.Doesn't have guilty and addiction history. 4.Doesn't have disability and maim. 5. Homeless 6.Does not be unconscious. Patients who was in other study or cannot speak Persian go out of study. At first researcher explained goals of study and then if patient like to participate in study, after getting written testimonial, researcher complete demographic information form, financial and physical unmet needs questionnaire- that is created by researchers- and Ways Of Coping questionnaire[12] by interview. Information collected base on says of patients, files or pathological reports. Major questionnaire of study is unmet needs form that it's items provided from reviewing articles that evaluate cancer patients needs and library's studies by executors study, that access financial and physical needs and include 14 close questions by two sectional, multiple sectional scales and likert scale. Validity and reliability of this tool calculated by Cronbach's α coefficients that was equal 0.7904.To evaluate coping use coping questionnaire that contains 53 questions with 6 subcategories based on patient coping method with disease, contain: dropped due to low loadings, behavioral allusion-avoidance, centralization social aspect, subject avoiding, recognizable allusion-avoidance, research and catch social support. Questionnaire scale contain likert scale from 0-5(strongly disagree, disagree, neutral, agree, strongly agree). For coping interview take average. Cronbach's α coefficients for Persian questionnaire was 0.6974. Information collected by patients says, files or pathological report. Information were analyzed after completing informational forms and questionnaires. SPSS for Windows version 11.5 was performed for statistical analysis. data analyzed by chi square for quality variables and chi2 and point biserial correlation coefficient for quantity variables.

This research was accepted to research administer of Tehran University Of Medicine.

And researchers promise to protect secret information of patient.

Results

The most sample of this study were Iranian married women (75.5 percent) that just 24.5 percent of them had family background of cancer. The religion of sample group were Muslim and Shiite (95.5 percent). Also colon cancer (20.7 percent), breast cancer (21.3 percent) and stomach cancer were prevalent cancer in the sample group.

The grade of disease was 2 in 36.6 percent of patients and then it was 3 in 33.1 percent of patients. (table 1)

Correlation coefficient showed there was not significant relationship between financial unmet needs and coping strategies with cancer in this research. (table 2)

Table 1. Characteristics of the study participants

Characteristic	Types	Percent
Gender	Male	27.7
	Female	72.3
Marital status	Married	72.3
	Single	15.5
	Divorced	3.9
	Other	7.1
Education	Elementary School	24.3
	School	36.9
	High school	23.5
	BA and higher than	15.3
Cancer type	Breast	21.3
	Colon	20.7
	Stomach	5.3
	Other	43.7
Malignancy degree	1	18.3
	2	36.6
	3	33.1
	4	11.3
	missing	0.7

Table 2. Relationship between financial unmet needs and coping strategies

Coping strategies	r	P
Seek and use social support	0.01	0.9
Cognitive escape-avoidance	0.06	0.5
Distancing	0.06	0.6
Focus on the positive	0.20	0.06
Behavioral escape-avoidance	0.08	0.5
Dropped due to low loadings	0.16	0.11

Investigating the relationship between physical unmet needs and coping strategies with cancer shown there was a significant negative relationship between one of coping strategies (distancing) and physical unmet needs ($p<0.043$, $r=-0.21$). These results is shown in table 3 also among treatment procedures chemotherapy was in relationship with financial unmet needs ($chi2=4.65$, $p<0.031$) and there was a significant relationship between surgery and physical unmet needs ($r_{pbs}= 0.22$ $p<0.027$). (table 4 & 5)

Table 3. Relationship between physical unmet needs and coping strategies

Coping strategies	r	P
Seek and use social support	-0.04	0.7
Cognitive escape-avoidance	0.16	0.1
Distancing	-0.2	0.04
Focus on the positive	-0.14	0.2
Behavioral escape-avoidance	0.03	0.7
Dropped due to low loadings	-0.09	0.3

Table 4. Relationship between finantial unmet needs and treatment procedure

	Chi2	df	P
Chemotherapy	4.65	1	0.031
Surgery	0.359	1	0.549
Radiation therapy	0.106	1	0.745

Table 5. Relationship between physical unmet needs and treatment procedure:

	r_{pbs}	P
Chemotherapy	-0.046	0.648
Surgery	0.220	0.027
Radiation therapy	0.008	0.937

Discussion

According to results we didn't find any significant relationship between financial unmet needs and coping strategies with cancer. In the previous studies, there wasn't any study about association between financial unmet needs and coping strategies with cancer. However, Drageset et al. (2005) examined the relationship between demographic characteristics, social support, anxiety and coping in the breast cancer patients. The results of his study revealed that social support and demographic characteristics has positive effect on coping strategy and to recovery from cancer. [10] Mathews (2009) in a study that describes barriers cancer care providers face in identifying patients who have financial concerns found family members rather than patients may have better awareness of financial concerns, [13] then perhaps the patients had less awareness about their own financial problems.

In addition, the most sample of this study were women that probably support from their husbands, so they had low awareness about financial problems.

We found a significant negative relationship between physical unmet needs and "distancing" as a coping strategy with illness. In other words less physical unmet needs in patient is correlate with more distancing from illness and more physical unmet needs in patient is correlate with less distancing from illness. It's clear that less physical unmet needs had affect on patient's perception of intensity and existence of illness and so provide possibility of distancing from illness.

The relationship between chemotherapy and unmet financial needs may result from high costs of drugs used in chemotherapy and the long duration of chemotherapy treatment and the relationship between surgery and physical unmet needs may be caused by physical disabilities resulting from surgery. These are more than disabilities resulting from other methods of treatment, Akechi et al. conducted a study on examining relationship of needs felt by patients and quality of life, stress and patients characteristics with intensity of needs felt. This study showed that there is a significant relevance between the employment positions of a patient, period since the cancer was diagnosed, and intensity of cancer and poor performance of the patient against needs felt by him/her (including unmet physical needs).[14]

Patients whose illness is more advanced, many aspects of their needs, specially physical and mental needs, or more unmet.[5,15,16]

Conclusion

If we wish to provide comprehensive care for cancer patients, the care, support and medical treatment of patients' assessment is significant.[4] Reaching mental, physical and positivistic conformity is essential for enabling the patient to resume his activities before the diagnosing with cancer.[9] During the past two decades, attention to physical problems associated to diagnosing cancer has increased. Many researches are dedicated to understanding how patients cope with their illness. Coping with illness in various cancers, specially breast cancer, was examined and studied, establishing the relationship between stress, survival and cancer relapse and return to cancer.[1,2]

This study, explains various methods of with cancer in cancer patients. Although, the hypothesizes on the relationship of unmet financial needs and coping with cancer were not proved, but it proves the relationship between unmet physical and financial needs with methods of treatment. Pursuant to the confirmed hypothesis, we recommend the policy makers of the country to draft plans for financial and physical protection, with due consideration of various stages of the illness (from the beginning until advanced stages) for cancer patients. It is also recommended that future researches examine the financial problems and unmet financial needs of families who are taking care of cancer patients.

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Serum fgl2 levels elevated in patients with acute coronary syndrome (ACS)

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Abstract

Objective: To measure the peripheral serum levels of fgl2 in patients with acute coronary syndrome (ACS), analyze the relationship between ACS and the severity of coronary artery lesions .

Methods: 73 patients with coronary heart disease and 15 persons without coronary heart disease were studied. There were 21 patients with acute myocardial infarction(AMI), 32 patients with unstable angina pectoris(UAP), 20 patients with stable angina pectoris (SAP). All patients with coronary heart disease inspected by coronary angiography were divided into three vessel lesions group, two vessel lesions group and single vessel lesion group by the lesions severity of coronary artery. The serum concentrations of soluble fgl2 were measured in all patients with coronary heart disease and controls. The extent of coronary arteriostenosis was evaluated with Gensini Scores. The levels of serum fgl2 and the extent of coronary arteriostenosis were analyzed.

Results: Serum fgl2 levels were remarkably higher in patients with AMI group and UAP group than those in SAP and NCHD group($p<0.05$), there was no significant difference in the level of fgl2 between SA group and NCHD group($p>0.05$). Gensini Scores were no significant difference in patients with different types of coronary heart disease ($p>0.05$).

Conclusion: Level of serum fgl2 increased in patients with ACS and it may be maker of unstale plaque in acute coronary syndromes.Levels of serum fgl2 had no relation with the severity extent of coronary stenosis among patients with coronary heart disease.

Key words: fgl2; ACS

Introduction

fgl2 prothrombinase, a member of the fibrinogen superfamily, which was primarily reported to be produced by activated macrophages, T cells, and endothelial cells. Fgl2 functions as a strong prothrombinase which directly cleaves prothrombin to thrombin leading to fibrin deposition in the absence of factor VII or factor X[1].The direct prothrombinase activity of fgl2 is implicated in the pathogenesis of several inflammatory disorders including fulminant hepatitis and severe hepatitis, alloand xeno-graft rejection[2, 3, 4]. As we all know, inflammatory and thrombosis is closely asssosiated with acute coronary syndrome (ACS), whether Fgl2 is associated with acute coronary syndrome (ACS) is still unknown.

In this study, we observe the serum fgl2 level in acute coronary syndrome patients and the the relationship with the extent of coronary stenosis among patients with coronary heart disease.

Subjects and Methods

Between July 2010 and December 2010, 73 patients with coronary heart disease and 15 persons without coronary heart disease at the first afficiated Hospital of Nanchang University were studied. Among patients with coronary heart disease, there were 21 patients with acute myocardial infarction(AMI), 32 patients with unstable angina pectoris(UAP), 20 patients with stable angina pectoris (SAP). There were 58 male and 30 female patients enrolled, our institutional review committee approved this study. Patients were informed of the investigative nature of the study.

Definition of acute coronary syndrome

Patients with ACS were classified into the following standard subtypes: AMI and UAP. The GRACE diagnostic criteria of inclusion for AMI, according to the rationale and design of the GRACE investigators, was met if patients had a cardiac ischemic symptom and at least one of the following increases in cardiac enzymes: 1) creatine kinase MB fraction (CK-MB) >2 times upper limit of the hospital's normal range, and/or 2) positive Troponin T result.[5] NSTEMI was defined

as occurrence of acute MI with positive cardiac enzyme results, with or without accompanying electrocardiographic changes other than ST segment elevation. STEMI was defined as persistent ST segment elevation of ≥1 mm in 2 contiguous electrocardiographic leads or the presence of a new left bundle branch block with positive cardiac enzyme results. [5] The diagnostic inclusion criteria for UAP, according to the rationale and design of the GRACE investigators, was met if patients had a cardiac ischemic symptom with serial enzymes and ST segment elevation negative for MI. [5] Patients were excluded if they had

1) Cardiomyopathy,
2) Cancer,
3) Valvular heart disease,
4) Obstructive pulmonary disease,
5) Trauma Burns,
6) blood diseases,
7) severe liver and kidney dysfunction,
8) history of stroke and cardiovascular surgical history in the past six months,
9) Patients who had Serious infectious diseases and taken Immune inhibitors in a month,
10) Rheumatic heart disease,
11) Aortic Dissection.

Angiographic assessment

Coronary angiography was performed by the Judkins technique through femoral artery access. The angiographic characteristics, which included lesion location and percentage stenosis, of all coronary lesions in the index coronary angiogram were obtained by thoroughly reviewing the angiogram. CAD was defined as > 50% luminal diameter stenosis of at least one major epicardial coronary artery. The Gensini scoring system was used to calculate coronary disease severity. [6] This method defines narrowing of the lumen of the coronary arteries as 1 for 1-25% stenosis, 2 for 26-50% stenosis, 4 for 51-75% stenosis, 8 for 76-90% stenosis, 16 for 91-99%, and 32 for total occlusion. The score is then multiplied by a factor that represents the importance of the lesion's location in the coronary artery system. For the location scores, 5 points were given for the left main lesion; 2.5 for the proximal left anterior descending (LAD) or left circumflex (LCX) artery; 1.5 for the mid segment LAD and LCX; 1 for the distal segment of LAD and LCX, first diagonal branch, first obtuse marginal branch, right coronary artery, posterior descending artery, and intermediate artery; and 0.5 for the second diagonal and second obtuse marginal branches. The grades of luminal narrowing were determined according to the consensus opinion of two experienced interventional cardiologists.

Fgl2 level Assays

During the procedure, blood was drawn into ethylenediaminetetraacetic acid vacuum containers. Fgl2 was assayed with a noncommercial enzyme linked immuno sorbent assay (ELISA), ELISA Kit for Human Fibrinogen Like Protein 2(FGL2) was purchased from Huamei Bioscience Technology Ltd(China, E0512Hu).We used the GRACE risk scores and compared it with serum Fgl2 concentrations.

Statistical analysis

Baseline demographic and laboratory data are presented as mean ± SD for continuous variables and frequencies for discrete variables. Comparisons among groups were calculated with an analysis of variance for continuous variables and Pearson's chi-square test for discrete variables. Correlations between the Fgl2 level and Gensini score were examined by linear regression analysis. All data were analyzed using statistical software SPSS for windows version 11.0.

Results

Characteristics of patients

73 patients with coronary heart disease and 15 persons without coronary heart disease were studied. Among patients with coronary heart disease, there were 21 patients with acute myocardial infarction(AMI), 32 patients with unstable angina pectoris(UAP), 20 patients with stable angina pectoris (SAP). The baseline clinical and laboratory findings of the three groups were summarized in Table 1. There were no significant differences in age, sex, total cholesterol, TG, LDL-C, and HDL-C among these groups.

Table 1. Characteristics of patients

Variables	Control	SAP	UAP	AMI
Age	50±6.31	51±5.36	54±10.14	56±12.1
Sex(Male/Female)	11/4	14/6	19/13	14/7
total cholesterol	4.50±0.80	4.54±0.87	5.01±0.74	4.96 ±0.32
triglyceride	1.65±1.05	1.90±0.84	2.08±1.23	1.74±0.57
high density lipoprotein	1.20±0.83	1.06±0.23	1.01±0.21	1.08±0.12
Low density lipoprotein	2.63±0.71	2.70±0.84	3.06±1.02	2.94±0.73

Serum Fgl2 level and coronary artery lesion

As shown in Table 2, Fgl2 level elevated in AMI and UAP groups as compared with SAP and control groups($P<0.01$).There were no significance between SAP group and control group($P > 0.05$). As shown in Table 3, there were no significance among single vessel, double vessel , three vessel groups($P > 0.05$).We also found that there were no Correlations between serum Fgl2 level and coronary gensini scores, ($r=-0.044$;$p=0.460$) (Fig.1)

Table 2. Fgl2 levels in different groups

	n	fgl2 (pg/ml)
Control	15	33±4.45
SAP	20	38±4.12
UAP	32	45±6.01 △
AMI	21	51±7.03 △

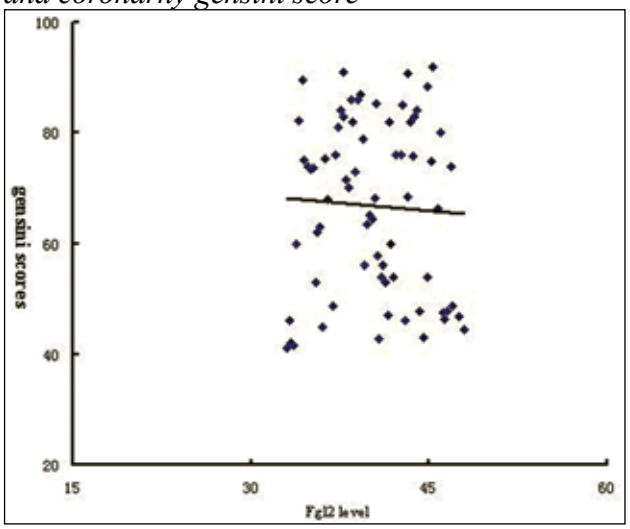
Table 3. The relationship between numbers of coronary artery lesion and fgl2 level

	n	fgl2(pg/ml)
Single vessel	29	41±4.56
Double vessel	36	32±6.01
Three vessel	23	46±5.03

Table 4. Gensini scores in coronary artery disease patients

groups	n	gensini scores
SAP	20	67.07 ± 20.57 ◇
UAP	32	71.26 ± 19.56 △
AMI	21	65.08 ± 18.5

Figure 1. Correlations between serum Fgl2 level and coronarhy gensini score



Discussion

Acute coronary syndrome (ACS) refers to the array of clinical signs and symptoms produced by acute myocardial ischemia, including unstable angina (UA), non-ST-segment-elevation myocardial infarction (NSTEMI), and ST-segment-elevation myocardial infarction (STEMI). [7] Each condition shares common pathophysiologic origins related to the instability and rupture of atherosclerotic vulnerable plaques. [8] Unstable angina and NSTEMI are differentiated one from the other primarily by their severity—whether the ischemia is prolonged enough to lead to structural myocardial damage and to the release of detectable markers of myocardial injury, most commonly troponin I, troponin T, or creatine kinase MB. [9]

In this study, we found that serum Fgl2 level increased AMI and UAP groups, but it did not increase in SAP group, which indicated that Fgl2 may be involved in instability and rupture of atherosclerotic vulnerable plaques.In addition, we observe the Fgl2 level in single vessel, double vessel , three vessel lesion groups, there were no significance. We also found that there were no correlations between serum Fgl2 level and coronary gensini scores.In summary, Fgl2 elvelated only seen in AMI and UAP groups, which suggested that Fgl2 is involved in the process of AMI and UAP.There were no significance of Fgl2 levels in patients with coronary complex or simple and No correlation of Fgl2 with Gensini score suggest that

serum Fgl2 does not reflects the severity of coronary atherosclerotic stenosis.

From our analysis with the CHD subgroup of patients, it is clear that Fgl2 levels were much higher in those with acute coronary syndrome than in those with stable angina pectoris and without CHD, suggesting that Fgl2 is a hallmark of unstable atherosclerotic plaque and myocardial ischemic injury. The mechanism likely due to active matrix degeneration, plaque destabilization, and consequent thrombosis during pathogenesis of AMI.

As we known, Fgl2 functions as a strong prothrombinase which directly cleaves prothrombin to thrombin leading to fibrin deposition in the absence of factor Ⅶ or factor Ⅹ.So we think that Fgl2-induced thrombosis may be involved in ACS process.In conclusion, the present study revealed that Fgl2 may be powerful predictors of prethrombosis in the coronary circulation indicative of plaque destabilization, which ultimately precedes myocardial injury. However, the case number is very small in this study, future prospective studies are warranted to confirm these results.

Acknowledgements

This work was supported by a grant from the National Nature Science Foundation of China (No. 30960119) and the Department of Health Science and Technology Plan of Jiangxi province (NO. 20081198).

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Accuracy Of References In Eight Nursing Journal

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Abstract

Background: Reference lists serve as a resource for the author's ideas. Inaccurate references hinder retrieval of documents, may prevent researchers from examining all of the work by an author and may result in authors not getting credit for their work. The aim of this study was to determine the number and types of errors in nursing research journal reference lists.

Methods: Randomly selected eight hundred references collected from the Public Health Nursing, Community Health Nursing, Journal of Clinical Nursing, Journal of Wound Ostomy and Continence Nursing, European Journal of Cancer Nursing, Cancer Nursing, Nephrology Nursing Journal, Journal of Neuroscience Nursing in 2008 were evaluated for citation errors.

There were 2785 citations of these journals during the study period. One hundred references from each journal were selected randomly and analyzed for accuracy.

Results: The overall error rate was 34.8% (342), 92.7% (317) of references error were major and 7.3% (25) of references error were minor.

Conclusion: The results of this study are important in that they attract attention towards reference errors in the nursing literature. Researchers should also exercise caution with offering references and should definitely write their references in accordance with original sources. They should check their articles in terms of accuracy in references before sending them for publication. Authors should avoid unnecessary use of references and write references in accordance with instructions to authors required by journals. Reviewers should also make sure that references in the articles they reviewed are accurate.

Key words: Research; Reference error; Nursing journal.

Introduction

Articles available in scientific journals conclude with a list of references cited in the article [1]. According to the Publication Manual of the American Psychological Association (5th ed.), "Reference data must be correct and complete" (p. 216) [2]. Reference lists are an important part of scientific publication and serve several important functions [3-4]. Accurate references in research studies are essential for the transmission of scientific knowledge [5]. Readers make use of references to access to the available relevant literature, i.e. both previous and current studies conducted and become aware of his/her own deficient knowledge and different points of views [1].

Inaccurate references may prevent the retrieval of the original publication and propagate misinformation [6]. Additionally, incorrectly cited references devalue the credibility of the article, the authors and the journal [7]. In electronic databases, the author's name and article title are important because the computer will not recognise an error or a misspelling when the search is done [1]. Therefore, it is imperative that they should be written properly to make searching easy. Authors have a responsibility for preparing accurate and relevant references [8]. However, it has been reported that authors and readers do not usually show much care about references; they show interest in the issue only when it hinders their studies [9]. Therefore, educators should increase students' awareness of accurate references [10]. Reference errors could be objectively classified as major or minor [11]. Major errors such as errors in the publishing year, volume, name of the journal, authors' name, title of the article, volume number, year of publication, and first page make immediate access to references particularly difficult. Minor errors include misspellings, minor

omissions (not preventing identification) and substitutions, and incorrect author initial or page number errors other than the first page [1,11-12].

There have been studies on reference errors in the medical and nursing literature. Over the years various studies have shown a high rate of reference errors in articles published in **general medical journals** and in journals of medical specialties. Previous studies of journals of biomedical sciences have revealed the overall rates of reference errors of 13.7%-45% [1,5-6,11,13-16].

Some of these studies are as follows: Aronsky et al. in a study of five biomedical informatics journals, found a total error rate of 34.3% [14]. The reference error rates by journal ranged from 22.1% to 40.7%. Most errors (39.0%) occurred in the author element, followed by the journal (31.2%), title (17.7%), page (7.4%), year (3.5%), and volume (1.3%) information. Siebers, examined three allergy journals and found errors in 17.7%-28.2% of the references [15]. Author errors were the most common, occurring in more than half of all the erroneous references. Title errors were the second most common, followed by page errors, journal errors, volume errors, and year errors.

The error rates of **nursing journals** have ranged between 22.9% and 54% [4,7,9,12,17-18].

Some of these studies are as follows: Suk et al. reviewed four hundred and sixty-six references in eight nursing journals in Korea and found errors in 28.6% to 58.7% of the references [18]. Most errors occurred in the author element (37.9%), followed by title (20.9%), journal (19.0%), page (13.9%), volume (5.9%), and year (2.4%). Oermann and Ziolkowski, examined three critical care nursing journals and reported an error rate of 22.9% [4]. Major errors, such as misspelled or omitted author names and initials, occurred in 19.6% of the references. Minor errors, including non–first page discrepancies, occurred in 4.5% of the references. Errors in author names combined with incorrect or missing volume or issue numbers were the two most common errors, accounting for 61% of errors.

Reference error rates have been studied extensively in the medical literature. There are few studies in nursing that have looked at reference errors. Studies on reference errors in the nursing literature have been conducted on fewer journals and references.

The purpose of this study was to determine current number and types of errors in eight peer reviewed, widely read nursing journals: Journal of Community Health Nursing, Public Health Nursing, Cancer Nursing, European Journal of Oncology Nursing, Journal of Clinical Nursing, Journal of Wound Ostomy and Continence Nursing, Nephrology Nursing Journal, Journal of Neuroscience Nursing.

Methods

Randomly selected eight hundred references collected from the Public Health Nursing, Community Health Nursing, Journal of Clinical Nursing, Journal of Wound Ostomy and Continence Nursing, European Journal of Cancer Nursing, Cancer Nursing, Nephrology Nursing Journal, Journal of Neuroscience Nursing in 2008 were evaluated for reference errors. One issue of each journal published in 2008 was randomly selected. When we failed to reach a sufficient number of references, another issue of that journal was randomly selected. The study included only the references of research articles.

A total of 2785 references in 10 issues were included. The Public Health Nursing had 408 references in 11 articles. Community Health Nursing had 217 references in 8 articles. Journal of Clinical Nursing had 490 references in 12 articles. Journal of Wound Ostomy and Continence Nursing had 248 references in 5 articles. European Journal of Cancer Nursing had 465 references in 13 articles. Cancer Nursing had 506 references in 13 articles. Nephrology Nursing Journal had 180 references in 6 articles. Journal of Neuroscience Nursing had 271 references in 6 articles. One hundred references from each journal, 800 references in total, were selected randomly and analyzed for accuracy.

We excluded references to books, abstracts, technical reports, dissertations, web sites, manuals or other types of reports for which the original publication may not be easily accessible for verifying the accuracy of the references. The references were assessed for accuracy by comparing them with PUBMED. To achieve inter-assessor reliability, all the investigators involved in the study were offered training. During this training, the investigators were given references of research articles and asked to assess these references for

reference errors. The nursing journals included in the study are in the science citation index.

Reference errors in eight nursing journals were analysed made according to the criteria developed by Hinchcliff et al. and adapted by Taylor [9,19]. We also added omitted journal name and omitted volume, issue and year. Errors were classified into two broad categories: major and minor (Table 1). When there was more than one error in a reference, each type of error was counted once per reference [12]. For example, two errors were counted for a reference that had a misspelled author's name and errors in the title. Obtained data were analyzed with SPSS for Windows. We used descriptive statistics for the overall error rate and the rate in each error category.

Results

A total of 800 references taken from eight nursing journals were analysed. The prevalence of reference errors among eight nursing journals are summarized in Table 2.

There were a total of 342 (34.8%) errors in 800 references. Out of 342 errors, 317 (92.7%) were major errors and 25 (7.3%) were minor errors. E**uropean Journal of Oncology Nursing** had 70 major errors (100%), Community Health Nursing had 51 major errors (98.1%) and Wound Ostomy and Continence had 84 major errors (96.6%). Journal of Neuroscience Nursing had the least major errors (6/66.7%).

As for minor errors, Journal of Neuroscience Nursing had 3 errors (33.3%), Cancer Nursing had 6 errors (27.3%) and Journal of Clinical Nursing had 8 errors (14.5%) (Table 2).

The relative distribution of major errors by seven parameters is shown in Table 3. Omission of the author's name was the most common major reference error.

The article title was most frequently inaccurate in Wound Ostomy and Continence and Public Health Nursing and in fact, there were 31 (7.67%) and 13 (3.22%) errors in these journals respectively. The journal name was most frequently inaccurate in Wound Ostomy and Continence and Journal of Clinical Nursing and there were 13 (3.22%) and 12 (2.97%) errors respectively. The number of volume, year, issue and first page number errors was 46 (11.38%) in Wound Ostomy and

Table 1. Criteria for major and minor errors

Major Errors	Minor Errors
1 - Omitted or misspelled author names or incorrect initials 2 - Article title errors 3 - Wrong journal name or a major misspelling of the journal name 4 - Wrong volume, issue, year or first page numbers of articles 5 - Wrong listing or spelling of author's names 6 - Omitted journal name 7 - Omitted volume, issue, year	1 - Incorrect use of diacritical marks in author names 2 - Minor title errors (e.g. omission of subtitles and substitution of articles and prepositions) 3 - Page number errors other than the first page

Table 2. Major and minor error rates

Journals	No. of References Reviewed	No. of References with Errors	No. of Major Errors	No. of Minor Errors
Public Health Nursing	100	33 (33.0)	30 (90.9)	3 (9.1)
Community Health Nursing	100	52 (52.0)	51 (98.1)	1 (1.9)
Journal of Clinical Nursing	100	55 (55.0)	47 (85.5)	8 (14.5)
Wound Ostomy and Continence	100	87 (87.0)	84 (96.6)	3 (3.4)
European Journal of Oncology nursing	100	70 (70.0)	70 (100.0)	0
Cancer Nursing	100	22 (22.0)	16 (72.7)	6 (27.3)
Nephrology Nursing Journal	100	14 (14.0)	13 (92.9)	1 (7.1)
Journal of Neuroscience Nursing	100	9 (9.0)	6 (66.7)	3 (33.3)
TOTAL	800	342 (34.8)	317 (92.7)	25 (7.3)

Table 3. Distribution of major reference errors by seven parameters

Journals	Omitted or misspelled author names or incorrect initials	Article title errors	Wrong journal name or a major misspelling of the journal name	Wrong volume, issue, year or first page numbers of articles	Wrong listing or spelling of author's Names	Omitted journal name	Omitted volume, issue, year	Total
Public Health Nursing	16 (3.96)	13 (3.22)	5 (1.24)	8 (1.98)	0	1 (0.25)	1 (0.25)	44 (10.89)
Community Health Nursing	33 (8.17)	7 (1.73)	1 (0.25)	13 (3.22)	1 (0.25)	1 (0.25)	1 (0.25)	57 (14.10)
Journal of Clinical Nursing	30 (7.43)	6 (1.49)	12 (2.97)	6 (1.49)	0	0	0	54 (13.36)
Wound Ostomy and Continence	35 (8.66)	31 (7.67)	13 (3.22)	46 (11.38)	1 (0.25)	0	0	126 (31.18)
European Journal of Oncology Nursing	24 (5.94)	1 (0.25)	2 (0.49)	1 (0.25)	0	0	58 (14.35)	86 (21.28)
Cancer Nursing	11 (2.72)	2 (0.49)	0	2 (0.49)	0	1 (0.25)	1 (0.25)	17 (4.21)
Nephrology Nursing Journal	4 (0.99)	2 (0.49)	3 (0.74)	5 (1.24)	0	0	0	14 (3.46)
Journal of Neuroscience Nursing	1 (0.25)	0	0	5 (1.24)	0	0	0	6 (1.48)
TOTAL	154 (38.12)	62 (15.34)	36 (8.91)	86 (21.,28)	2 (0.49)	3 (0.74)	61 (15.10)	404

Continence and 13 (3.22%) in Community Health Nursing. Omission of volume, year and issue was most frequent in European Journal of Oncology nursing (58/14.35%) (Table 3) (Figure 1).

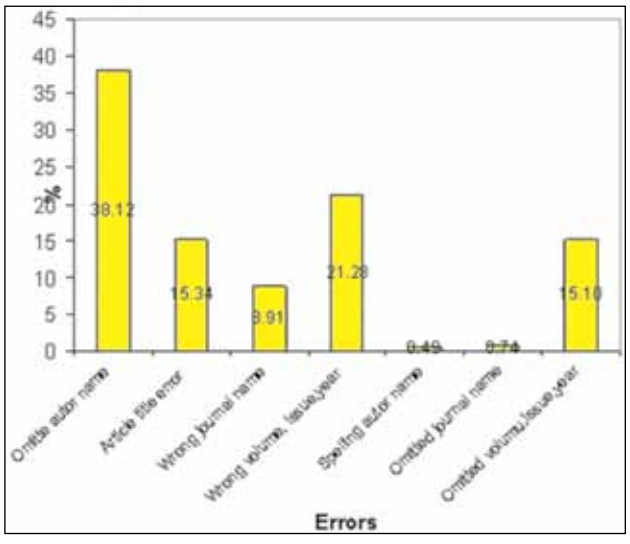

Figure 1. Distribution of major citation errors

The relative distribution of minor errors by three parameters is shown in Table 4. Misuse of the punctuation marks separating author names was the least frequent. Only Cancer Nursing had only 1 error (4.0%). The number of minor title errors was 6 (24.0%) in Journal of Clinical Nursing and 5 (20.0%) in Cancer Nursing. The number of errors in other pages was 2 (8.0%) in Journal of Clinical Nursing and 1(4.0%) in Public Health Nursing, Wound Ostomy and Continence and Nephrology Nursing Journal (Table 4) (Figure 2).

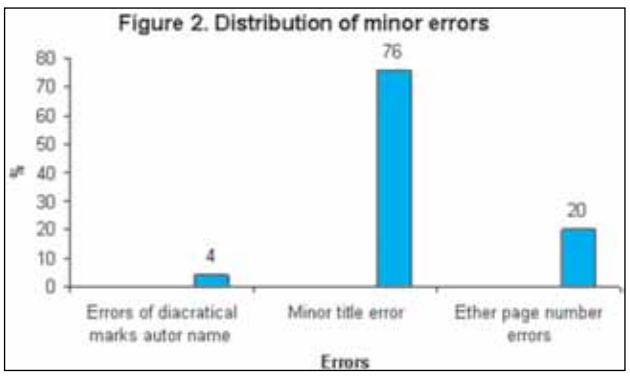

Figure 2. Distribution of minor errors

Table 4. Distribution of minor reference errors

	Misuse of punctuation marks separating author names	Minor title errors	Errors in other pages	Total
Public Health Nursing	0	2 (8.0)	1(4.0)	3(12.0)
Community Health Nursing	0	1(4.0)	0	1(4.0)
Journal of Clinical Nursing	0	6 (24.0)	2(8.0)	8 (32.0)
Wound Ostomy and Continence	0	2(8.0)	1(4.0)	3(12.0)
European Journal of Oncology nursing	0	0	0	0
Cancer Nursing	1 (4.0)	5 (20.0)	0	6 (24.0)
Nephrology Nursing Journal	0	0	1(4.0)	1(4.0)
Journal of Neuroscience Nursing	0	3 (12.0)	0	3(12.0)
TOTAL	1(4.0)	19 (76.0)	5(20)	25

Discussion

General Reference Errors

Reference errors both in nursing and non-nursing journals have frequently been reported. The rate of one or more reference errors in non-nursing journals has ranged between 22% and 66% [1,5,20-22].

We found that the rate of reference errors in eight nursing journals was 34.8% and that Wound Ostomy and Continence (87%) and European Journal of Oncology Nursing (70%) had the highest rate of errors and Journal of Neuroscience Nursing (9%) and Nephrology Nursing Journal (14%) had the lowest rate of errors.

A total of 120 references had at least one error for an overall error rate of 45.8% of nursing research journals [9]. Suk et al. in their study on reference errors in eight nursing journals in Korea showed a general error rate of 47.9% [18].

Oermann reported error rates of 25% in general nursing journals, 41.6% in pediatric nursing journals and 22.9% in intensive care nursing journals [12].

The reference error rate was higher in eight journals in this study than that reported in general nursing journals but lower than in pediatric nursing journals. When journals publish articles that contain poorly documented references, they also increase the likelihood that SCIE will omit those references. Eight nursing journals examined in this study are within SCI and SCIE indices and those within SCIE had higher error rates. These higher error rates can be due to an underestimation of the issue in undergraduate and graduate nursing education. Nurse authors should be careful with writing references to reduce reference errors in nursing journals. Authors should use primary or original sources in their writing. The author always should verify the accuracy of each reference against the original document.

Major reference errors

Major reference error rates in medical journals have been reported to range between 2% and 4% [5,11,20,23].

In the present study, 92.72% (317) of the reference errors were considered major errors. There was more than one major error in each reference and the total number of major errors was 404.

As in medical journals, major reference errors in nursing journals varied. Oermann et al. found that the major reference error rate was 19% in general nursing journals and 28.9% in pediatric nursing journals [4,12]. Taylor examined a total of 120 references taken from three nursing research journals and found that the major reference error rate was 38.3% and that the rate of more than one major reference error was 8.4% [9]. The major reference error rate was quite higher in this study than that found in non-nursing journals. Although rates of major reference errors were higher in nursing journals, they were lower than the major reference error rate found in the present study. The higher rate of major reference errors in this study can be explained by the presence of errors fulfilling more than one criterion for major reference errors.

The most frequently encountered author-created error was in the names of cited articles' authors. This accounted for 40-60% of all author errors [24]. It has been reported that the names of cited articles' authors were misspelled or omitted [4,9,12]. The rates of major reference errors in

authors' names in general medical journals range from 34.8% to 48% [1,22,25].

In the present study, the most frequent major reference error was misspelling of the cited authors' names at the rate of 38.12%. Oerman et al. noted that 60% of the reference errors in medical and nursing literature were in authors' names and titles. Among these errors were misspelled names of the authors, which were attributed to the use of secondary sources and writing references under hurried conditions [4,12]. Taylor, in a study on nursing research journals noted that misspelling or omission of the first letter of authors' names accounted for 56 out of 62 major reference errors [9]. Oerman et al. reported that the rate of misspelled authors' names was 36% in intensive care nursing journals and 23.3% in pediatric nursing journals [4,12]. Taylor ascribed these misspellings to long names of authors [9]. Such errors prevent other researchers from accessing sources used.

In studies on all reference errors, the wrong or missing volume, issue or first page number was the second most common error.

Ashman showed that SCIE corrected a much higher percentage of these types of mistakes than did the SFS citation index [24]. In studies on general medical journals, errors were concerned with page numbers in 5.7% -12.1% of the references, year of publication in 3%-4.1% and volume in 1.3%-6.1% [14,22,25].

In the present study, out of 404 major reference errors, 21.28% (86) were wrong volume, issue and first page and 15.10% (61) were omitted volume, issue and year of publication.

Oermann et al. in their study on general nursing journals reported that the most frequent reference errors was wrong volume, issue and first page at the rate of 48.3% [4]. In the present study we found a higher rate of wrong volume, issue, year of publication and first page than in the studies on the medical literature. The second most frequent error detected in this study was wrong volume, year of publication and first page, which is consistent with the results of the studies on nursing journals.

The issue number is essential to find an article in a particular volume. Authors should check the page proofs carefully because some of these errors may occur during production when reference formats are altered to fit the journal's style [4]. Accurate references enable the reader to locate documents easily, gather further information on the topic, and trace the work of a particular author. They also ensure that the author receives credit for the work. Considering that most journals do not have information specialists to verify references, authors should realize the importance of verifying the accuracy of their references [5].

Another type of major reference errors is concerned with article titles. Rates of errors in article titles in the medical literature range from 31.7% to 58.1% [22,25].

In the present study, the rate of errors in article titles was 15.34% (62), which is consistent with the nursing literature, but lower than in the non-nursing literature. Oerman et al. reported that the rate of article title errors was 12.5% in intensive care nursing journals and 17.7% in pediatric nursing journals [4,12]. Suk et al. found the rate of article title errors to be 20.9% in eight nursing journals [18].

Major errors are a problem for other researchers because they prevent the rapid retrieval of information. Errors decrease the value and usefulness of the article and journal in which it is published because they prevent the dissemination of scientific information. Inaccurate references also decrease the credibility of the author and journal [8].

Minor reference errors

Minor errors might be considered as a sign of disrespect or lack of courtesy to the author or authors, and may impact negatively on their academic records by excluding the name(s) from the citation index [5].

It has been reported that minor reference error rates are 2%-62% in non-nursing journals [5,22-23].

The minor reference error rate in this study was 7.3% (25). Of all the minor errors, 76% were minor title errors and 20% were page number errors. Journal of Clinical Nursing and Cancer Nursing had the most frequent minor title errors at the rates of 24% and 20% respectively.

It has been reported in the nursing literature that minor reference error rates range from 4.5% to 13.8%. Oerman et al. found minor reference errors to be 4.5% in intensive care nursing journals and 13.7% in pediatric nursing journals [12]. The minor reference errors found in the present

study were consistent with those reported from the nursing and non-nursing literature.

It is desirable that reference errors, major or minor, should never occur. We found that eight nursing journals in SCIE had higher reference error rates. Lower rates of reference errors increase the credibility of journals and make articles easily available to readers. Errors in reference use can be avoided only by careful reading of each original reference in its entirety and considered placement of references relative to statements they are intended to support [23].

Conclusion

The results of this study are important in that they attract attention towards reference errors in the nursing literature. Such major errors as missing author initials, or a wrong spelling, do not devalue the reference greatly, but they do reflect a lack of attention to detail [8]. Accurate references allow readers to access to relevant literature easily and help them to gather information they need. They also help readers to become aware of different viewpoints [1]. Therefore, it is of great importance to reduce reference errors. Emphasis should be placed on accuracy in reference during nursing education. Researchers should also exercise caution with offering references and should definitely write their references in accordance with original sources. They should check their articles in terms of accuracy in references before sending them for publication. Authors should avoid unnecessary use of references and write references in accordance with instructions to authors required by journals. Reviewers should also make sure that references in the articles they reviewed are accurate.

Authors' contributions

ZB,AB,OK,FV,AA, OK, and OU collected all data, generated the database, designed. ZB,AB,OK,FV,AA, OK, and OU contributed to the development of the study design and ZB,AB,OK advised on statistical analysis. The analysis and results were discussed by all authors together. ZB and AB contributed to interpreting the results and drafting the manuscript. All authors read and approved the final manuscript.

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Illegal drug self-poisoning induced death; Referred or not referred to Health system in Mashhad, Iran 2004-2007.

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Abstract

Overdose including accidental and intentional, and illicit drug abuse is common in Iran. All deaths related to illicit drug overdose including Imam Reza hospital data (*H*) and Mashhad Forensic Medicine data (*F*) were gathered retrospectively from 2004 to 2007.

In the period of study, 364 deaths recorded. 92% *F* and 79% *H* were Male. 85% of poisoning referrals to *H* have been poisoned with opiate and 15% of them with alcohol and other drugs, while 99% of deaths referred to *F* have been poisoned with opiate.91% of *H* cases were intentional, whereas same result in *F* were 99.7% . Approximately 86% of intentional poisoning cases have been referred to *H*. 73% of *H* referred cases have been poisoned with alcohol; but in *F* cases, 85% have been poisoned with opiate.

If referring to the *F* has considered as higher mortality rate, opiate toxicity had high mortality rate.

Key words: Forensic Sciences, Illegal drug, Poisoning, Hospital, Opiate, Iran

Introduction

In the last century poisonings caused by drugs and poisons have been increased as a result of introducing various chemical formula and combination to the market and it is one of the problems of the modern and developed society and medical world [(1)]. Annually millions of people are poisoned as a result of contacting different drugs and a lot pass away because of the intensive effects. These poisonings can be caused as a result of suicide, accident or crime [(2)].

15-20% of the patients to emergencies include the poisoned and about 50% of the patients who are staying in ICU wards are related to poisoning. The investigation and study of the cause of death out of poisoning can play an important role in decision making and improving the necessary standards for preventing poisoning with identifying poisoning priorities and can be effective in facing these kinks of patients and giving scientific and efficient services.

According to the variety of the poisonings in the world and Iran, and its getting affected from culture, religion, and beliefs of people and the cultural and social differences of our society, the spread out of these poisoning is different from the chemical and medicinal poisonings of other countries. On the other hand getting familiar with epidemiologic data of fatal poisonings can definitely be an appropriate way for alerting people and choosing ways for prevention of these sorts of poisoning [(3)].

One of the basic lacks of the health system is categorized data, according to the fact that the improvement of care variables in emergency toxicology ward is deeply affected by continuous programming and the improvement of management variables for planning the prevention of poisonings and finally it will decrease the death rate inside the society.

Fortunately, in recent years more attention has been paid to social-health dimension of poisonings and new dimensions have been clarified, so they can be considered as the health priorities. Problems related to suicide or accidental poisoning of children, teenager suicides and crime against ladies and children, passenger health care, and sexual rate differences and death rate are of these group. Possibly we can solve some of the abovementioned problems by epidemiologic studies, in a way that the threatened groups are identified so that health interfering goals are taken into consideration in future [(4)].

According to the historical records using drugs and drug abuse has been threatening human life and health for centuries and this destructive phenomenon which is becoming more harmful day by day, is

the major concern of the governors, and is the most common social disadvantage of the developing countries and industrialized communities. Drug abuse is common in Iran [5]. Iran has the highest average of drudge abuse in the world [7][8][9][10] and using illegal drugs is moving in the direction of risky combinations and methods [10][11]. Poisonings of drug abuse or accidental use of illegal drugs have allocated a high percent of the referred to health centers.

Although the rate of death out of drug abuse has been decreased in the past 2 years in our country [12][13], according to the high rate of poisoning and death as a result of drug abuse, research and study in different dimensions and various geographical areas will help in the control of this event.

Unfortunately there is no national data and statistics for the rate of the distribution of poisoning in illegal drug addicts. The studies which have been published out of the results of the referred to Forensic Medicine or poisoning wards of the hospitals in different provinces, show that using opioid drugs is the major reason of acute poisoning. For instance, in a study of 93 cases of death in Mashhad in 1995, opium has been reported as the main reason (32.8%) [14]. In a study of 178 of death cases of above 12 year olds of chemical and medicinal poisoning in 1996 in Loghman Hospital in Tehran, the most common used drug was opium (26%) [15]. The study of 88 death cases because of poisoning in Toxicology center of Isfahan, stated that the most common reason of death, has been opium use (11.9%) [16]. Even some studies have showed that poisoned with opioid drugs in children has been the most common reason of poisoning. 34 cases of poisoning with opium between 1991 and 1998 in children under 3 years old in pediatric medical center hospital has been reported [17]. Also in a study of the referred to pediatric emergency in Namazi Hospital in Shiraz because of poisoning, opium have been reported as the most common reason of poisoning [18].

This study has been done on the basis of a vaster research and for examining poisonings lead to death because of illegal drugs usage from different epidemiologic aspects. In this study the epidemiologic factors of dead patients who referred to poisoning ward of Imam Reza Hospital and dead poisoned patients in Forensic Medicine of Mashhad in a 3-year period from 2004 to 2007 has been examined in a descriptive-retrospective method.

Method

This study has been done on the basis of the data of existing files in Imam Reza Hospital and Forensic Medicine center. 240 patient's files from the poisoning ward were chosen and data collection forms were filled for them. Also about 3000 death records because of poisoning were extracted from Forensic Medicine center of Mashhad. In the end by examining all files and applying exclusion criteria (Incomplete information about toxic substances, poisoning route and clinical symptoms), 69 death cases in Imam Reza Hospital and 295 death cases because of illegal drug abuse in Forensic Medicine had been chosen for the final examination in this study.

According to this fact that the statistical data in Forensic Medicine center is confidential and clear statistical data was not accessible, it was not possible to estimate the sample volume at the beginning of the study, but at the end of data collection, 364 files which were according to the criteria of study were chosen and examined.

Results

The result of this study represent that the age average of death as a result of poisoning with illegal drugs which referred to Imam Reza Hospital (*H*) has been 48 and in Forensic Medicine center (*F*) 34. Also the most distribution of death cases as a result of poisoning in *F* is in the age range of 30-40 but in *H* it has been 40-50.

Comparison of some demographic characteristics and method of opium usage between Imam Reza Hospital referred and Forensic Medicine Center referred were illustrated in Tables 1 - 4.

Table 1. Comparison of Age groups between Imam Reza Hospital referred and Forensic Medicine Center referred

Age Groups	<10 y	10-19 y	20-29 y	30-39 y	40-49 y	50-59 y	60-69 y	70-79 y	>80 y	SUM
Imam Reza Hospital	0	1.5	15.2	18.2	21.2	13.6	15.2	10.6	4.5	100%
Forensic Medicine Center	0.3	3.4	32.4	36.4	21.4	4.4	1.4	0.3	0	100%

Table 2. Comparison of Sexual status between Imam Reza Hospital referred and Forensic Medicine Center referred

Sex	Male	Female	SUM
Imam Reza Hospital	21	79	100%
Forensic Medicine Center	8	92	100%

Table 3. Comparison of Marital status between Imam Reza Hospital referred and Forensic Medicine Center referred

Marital status	Married	Single	SUM
Imam Reza Hospital	26	74	100%
Forensic Medicine Center	60	40	100%

Table 4. Comparison of method of opium usage between Imam Reza Hospital referred and Forensic Medicine Center referred

Method of usage	Ingestion	Smoked	Injection	SUM
Imam Reza Hospital	41	34	25	100%
Forensic Medicine Center	17	26	57	100%

About 82% of poisoning cases because of illegal drugs which led to death were referred directly to *F* and only 18% were referred to *H*. In this study, among the poisoned patients who were taken in to *H*, 85% were referred as a result of using opium, 15% as a result of alcohol and psychotropic pills. In a similar comparison, among the poisoned patients referred to *F*, 99% referred because of poisoning with opium, 1% alcohol and psychotropic pills.

Among the referred to *H* as a result of poisoning with illegal drugs, 91% were intentional, 9% unintentional; however this rate was 99.7% intentional and 0.03% unintentional in *F*.

There has been a significant relationship between the place the poisoned referred and their gender according to Chi-Square Test (P<0.001), in a way that nearly 38% of females which died were referred *H* and 62% directly to *F*, and this rate for males has been 16% and 84% accordingly. On the other hand, 92% of the cases of poisoning referred to *F* include males, however in cases referred to hospital 79% were males.

In studying the marital status of the poisoned, according to Chi-Square Test, we found a significant relationship (P<0.001), in a way that about 26% of the referred to *H* are married, on the other hand among the poisoned referred to *F* nearly 60% include the married. Also only 9% of the married people which referred to *H* and the remaining which is 91% were referred to *F*, however the same data in single group are 29% and 71% accordingly.

This study found that relationship is significant between kind of poisoned illegal drugs and the place the poisoned referred (P<0.001). According to crosstab tables, only 16% of opium poisoned referred to *H* and the rest referred directly to *F*, while in other poisoned patients (non-opium) 71% referred to *H* and 29% referred to *F*.

The relationship between the method of poisoning and the place patients referred is significant (P<0.001). About 86% of intentional poisonings refer to *H*, however 83% of the unintentional poisonings referred to *F*.

There is a significant relationship between the method of poisoning and the place the poisoned refer, according to Chi-Square Test (P<0.001). More than 57% of referred cases to *F* were poisoned by injection, 26% by smoked, and 17% by ingestion, while in the case of referred to the *H* about 42% were poisoned by ingestion, 34% by smoked and 25% by injection.

According to Fisher's Exact Test there is a significant relationship between the age range and the referral centers (P<0.001). When the age increases, the number of the dead who were referred straight forward to *F* decrease and the number of referrals to the *H* increase.

In this study it is identified that in unintentional poisonings about 85% of males are referred to *F* as a result of poisoning with illegal drugs, while in the case of females only 68% are referred to *F* and the remaining 32% refer to *H*. There is no significant relationship in the case of intentional poisonings.

In our study of the existing relationship between marital status and the referred center of the poisoned according to there poisoning method (international or unintentional), in the case of intentional poisonings there is not a considerable relationship between the marital status and the place the poisoned were referred to.

In the case of unintentional poisonings, according to Fisher's Exact Test, the relationship between the above mentioned variables became

significant (P<0.001), in a way that 78% of the referred to *H* include singles and among those who referred to *F* 60% include the married.

There is a significant relationship between the type of the illegal drug and the center of referral in unintentional poisonings (P<0.001). Nearly 73% of the cases poisoned by alcohol referred to *H*, while 85% of the cases poisoned by opium were directly referred to *F*.

According to Fisher's Exact Test, there is a relationship between the method of using the illegal drug and the place people referred in the case of unintentional poisonings (P<0.001). In a way that the method of injection to smoked use and smoked use to ingestion use strongly affects the place of referrals. 91% of the cases poisoned with injection were referred to *F*, on the other hand 69% of the poisonings which were caused by ingestion were directly referred to *F*. (Maybe this result can be considered as the fatality rate).

On the basis of Fisher's Exact Test, in the case of unintentional poisonings there is a significant relationship between the age range and the place patients were referred (P<0.001); about 72% of direct referrals to *F* were under 40 years old which means that the average age of referrals to *H* was higher than the average age of referrals to *F*.

According to the regression analysis, it is shown that the effect of the variable "the type of illegal drug" in model (in level a=0.05) has not become significant so it is omitted from the model. In this study according to the above model there is a relationship between gender, marital status, the poisoning substance, average age of the poisoned, and the method of poisoning with the place of referral (or in other words the fatality rate of poisoning), in a way that the fatality rate in married people is four times as the single. In female poisonings, death chance decreases to 0.3 times compare to male. The fatality rate decreases to 0.6 times by alcohol and psychotropic pills in comparison to opium. The fatality rate with illegal drugs in age upper than 37 decreases 0.3 times in comparison to 37 or less. In the case of unintentional poisonings the chance of referring the poisoned with illegal drugs to *F* is 20 times more than intentional poisonings.

Discussion and conclusion

The age of the dead as result of poisoning with illegal drugs which were referred to *H* is higher than the age of the referred to *F*, which are harmonies with the result of the Liu (2009) study in China [22].

The rate of the referrals of the poisoned as a result of illegal drug use to *F* is much higher than referrals to *H* (82% to 18% which is about 4.5 times) which can be considered as the fatality rate of illegal drugs.

The rate of referrals to *F* in poisonings with illegal drugs in males is more than females (92% to 8% which means about 11.7 times), this statistics is harmonious with the result of the study done by Jalali in Tehran (1998) [27], Liu in China (2009) [22], Wells in England (2009) [24] and Zador (2007) [28].

The rate of referrals to *F* to *H* in the case of married is about 5 times by the single. This result is in contrast with the result of the study done by Zador (2007) [28]. Opiate drugs include the most illegal drug used in both centers which is similar to the results of Muhuri (2011) [19] and Wunsch (2009) [25] in the U.S, Karlovesk (2004) [20] in Slovenia, Zwingenberger (2010) [21] in Germany, Hosseinnian Moghadam in Tehran (2004) [23], wells (2009) [24] in England, Izadi Mood (2003) [26] in Isfahan and Jalali in Tehran (1998) [27]. The percent of referrals to *F* in poisoning with opium is more than *H* and this rate is much higher in poisoning with alcohol or EX (in order 84% to 16% opium, 29% to 71% in alcohol and EX); the result of the study done by Maag (2003) [32] is against these results.

In unintentional poisonings a high percent are referred to *F*, while in the case of intentional poisoning a high percent of referrals relate to *H* (in order 83% to 85%). These results are similar to the study done by Liu (2009) [22] and in contrast with Moghadam's study (2004) [23] in Tehran.

Most of the referrals to *F* are unintentional poisoning while referrals to *H* are often intentional poisoning, this result is similar to the result of Jalali's study in Tehran (1998) [27].

Referrals to *F* in poisoning by injection are 10 times as referrals to *H*. This in smoked poisoning is four times and in ingestion is two times. This issue represents the high rate of referrals to *F* in comparison with *H in* other poisoning methods, this data is in contrast with the result of Liu's study (2009) [22].

Like the results of the studies of Stenhous et al (2003) [29] and Brugal (2004) [31] the percent of referrals to *F* in comparison with referrals to *H* in the case of poisoning with illegal drugs in lower ages, without considering the method of poisoning (intentional/unintentional) is higher than poisonings in higher ages (about 72.4% of referrals to *F* under 40 while 65% of the referred to *H* include ages higher than 40).

In the case of unintentional poisoning with illegal drugs; the rate of the referred to *F* in comparison to *H* is higher among married, while among singles this rate is much lower (93% to 7% among married in comparison with 72% to 28% among singles), the results are similar to De Preux (2004) [30] study.

The referrals to *F* in the case of unintentional poisoning with opium are higher than the referrals to *H* in comparison with unintentional poisoning with alcohol (85% to 15% in unintentional poisoning with opium in comparison with that, 27% o 73% in the case of unintentional poisoning with alcohol).

In unintentional poisonings with the method of injection in comparison with illegal drug swallow, the rate of referrals to *F* is higher (in injection method this rate is 91% to 9% while in ingestion it is 69% to 31%).

In unintentional poisonings with illegal drugs in lower ages the referrals to *F* are more than referrals to *H*.

On the basis of data fitness the rate of the poisoned referred to *F* to *H* among married is 4 times more than the single. Among female poisoning this rate decreases by 0.3 time to male. The mentioned rate in poisoning with alcohol and psychotropic pills is 0.6 times less in comparison with opium. Referrals to *F* to referrals to the *H* in ages higher than 37, is 0.3 times less than ages below 37 and less. The chance of referring the poisoned with illegal drugs to *F* in the case of unintentional poisoning is 20 times more than intentional poisoning.

Acknowledgment

The authors thank Elmira Jafari for her assistance in article editing.

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Evaluation of alexithymic features of rheumatoid arthritis patients based on certain variables in Turkey

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Abstract

Aim: The present study was conducted to evaluate the alexithymic features of rheumatoid arthritis patients based on certain variables in Turkey.

Methods: One hundred twenty-four patients who applied to Physical Medicine and Rehabilitation Policlinic of Yavuz Selim Bone Diseases Hospital successively, were diagnosed as rheumatoid arthritis, no known psychiatric or neurological disorders that would interfere with the completion of the measurements, were aged ≥ 35, were able to communicate and agreed to participate were included in the study. Data were designed by the researchers and collected using questionnaire forms that identified the patients' socio-demographic and disease-related characteristics. The Toronto Alexithymia Scale, which assesses alexithymic features, was also used to assemble the data.

Results: There was not any statistically significant difference between the alexithymic features, difficulty identifying feelings, difficulty describing feelings, and externally-oriented thinking scores and patients' gender, marital status, educational status, social security coverage, employment status, age groups and place of residence ($p>0.05$). When the patients were grouped together according to the people with whom they lived ($p=0.036$), there was a significant difference between the groups in their capacity to describe feelings. There was also a significant difference between the groups in terms of alexithymic features when they were grouped according to disease duration ($p=0.020$).

Conclusion: The patients with rheumatoid arthritis who lived together with their spouses and whose disease duration was less than one year presented higher alexithymic features. When patients are able to identify and to describe their physical and psychological symptoms of rheumatoid arthritis, their chances for receiving treatment in a timely manner greatly improve.

Key words: Alexithymia, rheumatoid arthritis, Toronto Alexithymia Scale

Introduction

Clinical pain, morning stiffness, deformity, and inability to function in their daily lives are the complaints reported most often by rheumatoid arthritis (RA) patients (1). It is also known that some arthritis symptoms may be psychological, and these factors may contribute to the clinical presentation of the disease (2). RA is a prevalent chronic disease which greatly alters the daily life of those affected, threatens their self-worth, causes severe pain, and creates physical, social and emotional problems (1).

Although research has been conducted regarding the psychiatric aspect of rheumatic diseases, research on the alexithymic features of arthritis patients is limited. The Vadacca et al. study suggested that alexithymic features do manifest themselves during the disease progression of arthritis (2).

Alexithymia is a problem with difficulties in interpersonal relations and emotional functions and is characterized as difficulty in identifying and distinguishing between emotions (3). The word "alexithymia" means "without words for emotions" and manifests itself as an inability to identify and express feelings, a lack of fantasy, and an externally-oriented cognitive style (4).

These features appear more often in RA patients who have functioning disorders, and RA patients have been found to exhibit significantly higher alexithymia scores (2,5). The Vadacco et al. study revealed a prevalence of alexithymia of 54 % in RA patients and a 42% rate for those suffering from systemic lupus erythematosus (2).

Alexithymic patients have difficulty in identifying feelings and manifest these emotions with bo-

dily reactions instead of expressing them verbally (3,6). Since these patients seem unable to experience feelings in a normal way and to verbalize them as others do, this seems to be the impetus for some bodily symptoms when they have emotional difficulties. A decrease in patients' capacity to rely on their emotions to guide their behavior reduces their resistance to stress and limits their adaptation (7). Individuals with difficulty identifying emotions are inclined to misinterpret the physical and psychological symptoms of their bodies (8).

Suggestions have been made that alexithymia may be an important factor in the pathogenesis of unexplained physical symptoms (3). Pain is the most common complaint of RA patients. Reports indicate a high prevalence of alexithymia among the patients with chronic pains, and 22% of the patients with chronic pains are alexithymic (9). Alexithymia, seen more in old age, causes patients to have difficulty in identifying and describing their physical and psychological symptoms (8).

Patients with alexithymic features are affected by socio-demographic and disease-related variables. Studies on alexithymia emphasize variables such as gender, age and educational status (2,8,10,11). Alexithymic features are associated with the female gender, advanced age, low educational status, poor health perception and depression (10).

RA patients may have alexithymic features and may be affected by some of these variables because many individuals with an RA-diagnosis have difficulty in verbally expressing their emotions. These problems can develop when patients experience pain, issues related to aging, movement restriction and emotional challenges such as fear, anger, and worry (2,5).

Turkish studies evaluating the alexithymic features of patients with rheumatoid arthritis are limited. Therefore, the findings of this study will contribute to the literature currently available to health care professionals who provide services related to this issue.

The aim of this study was to evaluate the alexithymic features of patients with rheumatoid arthritis in terms of socio-demographic and disease-related variables.

Materials and methods

This study included 124 patients with RA who presented to the outpatient at the Physical Medicine and Rehabilitation Policlinic of Yavuz Selim Bone Diseases Hospital to receive outpatient treatment between January 2006 and April 2006. The study was conducted in a large hospital in Northeastern Turkey and almost all the patients with arthritis in this region, particularly those living in the vicinity of Trabzon, received arthritis treatment in that hospital.

Sample

The present study design involved cross-sectional and descriptive. The inclusion criteria were:

1. A diagnosis of RA.
2. No known psychiatric or neurological disorders that would interfere with the completion of the measurements.
3. Able to communicate.
4. Age ≥ 35. (Patients ≥aged 35 were selected because the age of onset of RA is between 35 and 40) (1,5).
5. Agreed to participate in the research.

We had hoped to include all patients who met the inclusion criteria, but 36 patients with impaired consciousness disorders, difficulty understanding the scale, or who had refused to participate were excluded from the research. Thus, only 124 cases were used for the final data analysis.

Procedure and data collection

A two part survey was used to collect the data. The questionnaire form included socio-demographic and disease-related characteristics and the Toronto Alexithymia Scale (TAS-20).

Questionnaire Form

After a review of the current literature, the researchers designed a two-part questionnaire form. The first part targeted socio-demographic characteristics, and the second part focused on disease-related characteristics. Part one included such socio-demographic data as gender, marital status, educational status, social security status, employment status, age, people with whom the patients lived together and place of residence. Part two covered illness-related data such as presence of other chronic illnesses, deformity, medicine use and disease duration.

Toronto Alexithymia Scale (TAS-20)

Alexithymic features of the patients were determined using the TAS-20. The TAS-20 was developed by Bagby et al. (12). Turkish reliability and validity studies were performed by Sayar et al. (13). It is a self-administered and Likert type scale with 20 items rated between 1 and 5. The scale measures alexithymia described as a person's inability to identify and describe their emotions. The total possible score was between 20 and 100. Higher scores meant a higher level of alexithymia. A cut-off point was used and those who got a score ≥ 61 were considered to be alexithymic (14).

The TAS-20 has 3 subscales: the first subscale is Difficulty Identifying Feelings (DIF): "I cannot exactly identify my emotions" (1,3,6,7,9,13,14); the second subscale is Difficulty Describing Feelings (DDF): "It is very difficult for me to find the right words for my emotions" (2,4,11,12,17), and the third subscale is Externally-Oriented Thinking (EOT): "I prefer talking about people's daily living activities rather than their emotions" (5,8,10,15,16,18,19,20). The Cronbach alpha value was 0.80 for the TAS-20 in this study.

Procedure

Each patients was contacted by a research assistant and provided with a detailed explanation of the aim and conduct of the study. The questionnaire form and TAS-20 used for the data collection were filled in by the researchers using face-to-face interviews with the patients in a separate quiet room of the policlinic. If the patients were unable to complete the questionnaire form on their own, the researchers read the questionnaire items to the patient and recorded the answers. The questionnaires took 20-30 mins to complete.

Ethics

The researchers obtained an approval from the Physical Medicine and Rehabilitation Policlinic of Yavuz Selim Bone Diseases Hospital, and informed consent was obtained from each patient. The aim of the research was explained to the patients and they were informed that if they preferred not to continue, they could withdraw from the study any time they wished. After these explanations, 124 patients consented to participate in the study voluntarily.

Data analysis

The statistical analysis was performed with the SPSS for Windows 11.0 program. In addition to using descriptive statistical methods (means, standard deviation, minimum, maximum, number, percentage), the Kruskal Wallis Variance Analysis and Mann Whitney U tests were used for the inter-group comparisons of parameters that did not follow a normal distribution. The results were assessed with a 95% confidence interval and a significance of $p<0.05$.

Results

A majority of the participating RA patients were women (81.5%); 98.4% were married; 64.5% had graduated from primary school and no formal education, and 91.9 % had social security coverage. Patients who did not work comprised 76.6% of participants; 59.7% were aged ≥65; 36.3% were living with their spouses and 42.7% lived in counties. It was noted that 29.8% of the patients had been coping with RA for 1-5 years; 76.6% had another chronic disease apart from arthritis; 23.4% had deformities caused by RA; and 78.2% used pain killers and nonsteroidal anti-inflammatory drugs (NSAIDs).

There was not any statistically significant difference between the TAS-20, DIF, DDF and EOT scores and patients' gender, marital status, educational status, social security coverage, employment status, age groups and place of residence ($p>0.05$). However, there was a statistically significant difference between the groups in terms of difficulty describing feelings when the patients were grouped according to the people with whom they lived ($p=0.036$) (Table 1).

We could not find any statistically significant difference between the presence or absence of another chronic disease, deformity, drug-use, and the TAS-20, DIF, DDF and EOT scores ($p>0.05$). Nevertheless, we found a significant difference between the groups in terms of alexithymic features when they were grouped according to disease duration ($p=0.020$) (Table 2).

Table 1. Socio-demographic features of the patients and mean TAS-20, DIF, DDF, EOT scores

Variables	n	%	TAS-20		DIF		DDF		EOT	
			Mean rank	Sum of ranks	Mean rank	Sum of ranks	Mean rank	Sum of ranks	Mean rank	Sum of ranks
Gender										
Women	101	81.5	60.0	6069.0	60.1	6074.0	61.2	6187.5	60.1	6075.0
Men	23	18.5	73.0	1681.0	71.8	1676.0	67.9	1562.5	72.8	1675.0
			U=918.000 **p**=0.117		923.000 0.125		1036.500 0.420		924.000 0.124	
Marital status										
Married	122	98.4	62.2	7101.0	63.5	7245.0	61.1	6975.0	61.5	7015.0
Unmarried	2	1.6	64.9	649.0	50.5	505.0	77.5	775.0	73.5	735.0
			U=546.000 **p**=0.826		450.000 0.270		420.000 0.167		460.000 0.310	
Educational status										
Primary school and ↓	80	64.5	65.5	5245.0	65.4	5238.5	61.0	4884.5	66.2	5297.0
Primary school ↑	44	35.5	56.9	2505.0	57.0	2511.5	65.1	2865.5	55.7	2453.0
			U=0.118 **p**=0.200		1521.50 0.212		1644.50 0.545		1463.00 0.118	
Social security										
Having	114	91.9	62.2	7101.0	63.5	7245.0	61.1	6975.0	61.5	7015.0
Not having	10	8.1	64.9	649.0	50.5	505.0	77.5	775.0	73.5	735.0
			U=546.000 **p**=0.826		450.000 0.270		420.000 0.167		460.000 0.310	
Occupational status										
Unoccupied	95	76.6	60.8	5781.0	61.5	5850.0	61.0	5795.0	60.2	5727.0
Occupied	29	23.4	67.9	1969.0	65.5	1900.0	67.4	1955.0	69.7	2023.0
			U=1221.000 **p**=0.355		1290.000 0.605		1235.000 0.398		1167.000 0.211	
Variables	**n**	**%**	**Mean rank**		**Mean rank**		**Mean rank**		**Mean rank**	
Age groups										
35-49	13	10.5	52.9		54.9		49.3		59.6	
50-64	37	29.8	60.7		61.6		65.3		56.1	
65 years and ↑	74	59.7	65.0		64.2		63.4		66.1	
			χ^2_{KW}=1.387 **p**=0.500		0.765 0.682		2.029 0.363		2.053 0.358	
People with whom patients lived together										
Alone	23	18.5	59.3		58.1		65.5		55.5	
Spouse	45	36.3	70.1		68.1		69.4		67.3	
Spouse and childrens	35	28.2	50.2		54.1		47.6		58.8	
Other family persons	21	16.9	69.9		69.1		69.0		65.8	
			χ^2_{KW}=7.164 **p**=0.067		4.089 0.252		8.557 **0.036**		2.225 0.527	
Living place										
Province	30	24.2	58.8		56.4		57.8		64.8	
County	53	42.7	67.9		68.2		68.3		66.0	
Vıllage	41	33.1	58.2		59.5		58.3		56.1	
			χ^2_{KW}=2.117 **p**=0.347		2.477 0.290		2.491 0.288		1.954 0.376	

Table 2. Illness-related features of the patients and mean TAS-20, DIF, DDF, EOT scores

Variables	n	%	TAS-20		DIF		DDF		EOT	
			Mean rank	Sum of ranks	Mean rank	Sum of ranks	Mean rank	Sum of ranks	Mean rank	Sum of ranks
Presence of a chronic disease										
Having	95	76.6	65.5	6224.5	65.6	6237.0	63.8	6063.0	63.0	5994.0
Not having	29	23.4	52.6	1525.5	52.1	1513.0	58.1	687.0	60.5	1756.0
			U=1090.000 **p**=0.090		1078.000 0.077		1252.000 0.457		1321.000 0.737	
Deformity										
Having	29	23.4	61.5	1785.5	64.3	1867.0	62.0	1798.0	57.6	1672.5
Not having	95	76.6	62.7	5964.5	61.9	3883.0	62.6	5952.0	63.9	6077.5
			U=1350.500 **p**=0.877		1323.000 0.747		1363.000 0.932		1237.500 0.406	
Drugs										
Pain killer+NSAİDs	97	78.2	63.5	6159.5	63.3	6145.5	62.6	6072.5	64.9	297.5
Pain killer+Anxiolytic +Antibiotic	27	21.8	58.9	1590.5	59.4	1604.5	62.1	1677.5	53.8	1452.5
			U=1212.500 **p**=0.557		1226.500 0.615		1299.500 0.952		1074.500 0.152	
Variables	**n**	**%**	**TAS-20 Mean rank**		**DIF Mean rank**		**DDF Mean rank**		**EOT Mean rank**	
Disease duration										
Less than 1 year	11	8.9	90.4		80.9		79.4		84.5	
1-5 years	37	29.8	56.7		56.5		57.1		65.5	
6-10 years	30	24.2	70.0		72.4		68.5		60.5	
11-15 years	21	16.9	49.6		50.1		59.0		47.2	
16 years and ↑	25	20.2	60.4		61.6		58.7		63.4	
			χ^2_{KW}=11.696 **p=0.020**		8.776 0.067		4.6114 0.329		8.411 0.078	

Discussion

Today's average life expectancy has been increasing, and arthritis has become a leading health problem affecting people's lives as they experience the physical changes of aging. When patients are able to accurately identify and describe their problems, they will be more likely to receive a timely diagnosis and proper treatment (15).

Our research found no significant difference between men and women in terms of alexithymic features. Although the alexithymic scores of the men were higher, this was not statistically significant. Other studies have demonstrated no significant difference regarding the DIF according to gender, however, the DDF and EOT scores of men were higher than the women's scores (16,17). Men are generally more inclined to EOT and those with higher alexithymic scores are less able to verbalize emotions. On the other hand, women experience fewer difficulties expressing emotions, and their thoughts are less externally oriented (16-19). Mattila et al. reported that alexithymic features were found in 11.9% of men whereas the rate was 8.1% in women (10). Similar to our study, two other studies with the elderly did not find gender an important factor in terms of alexithymic features (20,21).

Furthermore, patients' marital status did not affect alexithymic features. As in our study, the Joukamaa et al. study did not reveal a significant correlation between marital status and alexithymia (20). This contradicted the findings of the Mattila et al. study (8) in which a correlation between alexithymia and marital status was found when

alexithymic features were discovered to be more common in unmarried or widowed patients (10). The Kauhanen et al. study revealed that men who had decreased ability to verbalize feelings also showed more alexithymic features than unmarried men (18). But it should be noted that only 1.6% of participants in our study were unmarried.

The education level of RA patients may contribute to developing alternative ways and solutions for coping with the difficulties created by the disease (22). Mattila et al. indicated that educational level was negatively correlated with alexithymia. Individuals with a higher education showed alexithymic features at a rate of 3.3% while the rate for those with less education was 16.5% (10). Another study also reported a correlation between low educational status and alexithymia (23). However, our research findings do not support the idea that a low level of education plays a role in the formation of the alexithymic features.

Our research further revealed that patients with social security coverage are more apt to apply for health care in a timely manner, thus ensuring that patients with arthritis receive the appropriate treatment and care they need. This is particularly true when patients require many hospitalizations. When individuals with chronic diseases already face certain restrictions in many parts of their lives, if they also need financial support for their care and treatment, this only contributes to increased anxiety, and negative emotions arise to cause further distress (23,24). Yet, we could not find any correlation between social security coverage and alexithymia in our study.

The study found that employment status did not affect alexithymic features although the TAS-20 scores of people who worked showed higher general alexithymic features. Unlike our study, Kokkonen et al. reported a correlation between employment status and alexithymia. For young working adults the alexithymia prevalence was 9-17% in men and 5-10% in women (23).

We also discovered that the TAS-20, DIF and EOT scores of the arthritis patients aged ≥ 65 were higher. Yet, this finding was not statistically significant. However, Mattila et al. found a correlation between age and alexithymia and reported that alexithymic features were higher in elderly people. The alexithymic features were found to be at a rate of 4.7% in young people, whereas it was 29.3% in the elderly (10).

Every family has its own communication style and each family member's communication, behavior, and thinking styles are shaped in this sociocultural structure (6). It is well known and understood that the ability to express one's feelings is important to a person's psychological health. In our study groups arranged according to the people with whom our patients lived, we found a statistically significant difference between the groups in terms of DDF. The DDF scores appeared the highest among those who lived together with their spouses. Similarly, Yurt pointed out that alexithymic individuals generally continued to live in a nuclear family, and their rate of living alone was very low (25).

Various studies have demonstrated that alexithymic people did not behave in a natural manner. Although they generally liked company and seemed open to sharing, they somehow perceived they were different and preferred to conceal this from others (18,25-27). Palner and Mittelmark pointed out that married couples had a higher level of wellness and a lower level of depression and anxiety (26). Kauhanen et al. determined that men who demonstrated a low capacity for verbalizing feelings and had higher alexithymic features also developed a weakened social communication with wives, friends and acquaintances (18).

It is worth noting that the physical and psychological symptoms of arthritic patients with difficulty in describing feelings will likely increase. This may then begin a vicious circle which also triggers an increase in the patient's alexithymic feelings. Place of residence did not affect alexithymic features in our study. Similarly, the study of Joukamaa et al. did not present any correlation between place of residence and alexithymia (20).

In terms of alexithymic features our study results show no significant correlation between patients coping with both arthritis and another chronic disease. Unlike our study results, other studies have found a correlation among alexithymia, chronic diseases, and psychological disorders (10) between alexithymia and depression (11) and among alexithymia and such diseases as inflammatory bowel disease, essential hypertension, migraine and diabetes mellitus (28). The prevailing thought is that a new disease diagnosis will com-

plicate the patient's disease adaptation, and the identification and description of the body's physical and emotional symptoms.

The alexithymic features of the patients in our study were not affected by whether or not patients had a deformity. One study reported that people with RA who had more functional disorders also had higher alexithymia scores (5). Severe pain, fatigue and joint deformation may occur with the progression of RA and osteoarthritis, all of which may cause disabilities and emotional disorders (29). Hyphantis et al. reported that RA patients were inclined to be devoted, tough, highly self-controlled and perfectionists who also showed a low capacity in the ability to identify and describe feelings (30). Still another study revealed that RA patients showed a higher rate of emotional disorders (31).

The chronic course of the disease, functional limitations caused by the disease over time, and the continual need to use medicines may cause hardships for many patients whereby they eventually develop some physical and psychological complaints (22). The study of Turk observed that alexithymic features were significantly higher among those who had physical health problems or habitually used addictive medicines or other substances (32). However, our study findings indicated that medicines used by the patients were not a determining factor in terms of alexithymic features.

Our study also showed that general alexithymic features were affected by disease duration. Patients whose illness duration was less than one year showed higher alexithymic features. Another study demonstrated that RA patients who had the disease for less than one year experienced a higher level of anxiety and depression. Furthermore, for patients diagnosed within the last two years, the rate of possible psychological problems ranged from 13.3% to 33% (30).

Conclusion

Alexithymic features of the RA patients were affected by "illness duration" and "people with whom they lived together". Based on the results of our study data, additional clinical studies should be conducted on RA patients focusing on the different aspects of alexithymia. In addition, in order to increase the well-being of RA patients, health care workers should be thoroughly trained in identifying and assessing the alexithymic features of RA patients. This would help ensure that they receive appropriate and timely treatment with the goal of helping them learn to identify and describe their emotions.

Limitation

This study was conducted in only one city in Turkey. The results of this study may be generalized to the sample group in this study. The sample in this study reflects only one area of Turkey. The findings therefore cannot be generalized to all patients with RA in Turkey. Thus, further studies with larger Turkish sample sizes are needed. However we believe that because our study is the first to investigate the alexithymic features of patients with RA in Turkey, it will provide a foundation for future studies.

Acknowledgments

The authors are grateful to the outpatients for their participation in this study. We would also like to thank the director of the college for her support and cooperation and Paula Maria Knauer for the editorial support.

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The Anti-oxidants status and lipid peroxidation product of newly diagnosed and three-weeks follow up patients with pulmonary tuberculosis

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Abstract

Background: Oxidative stress is implicated in the pathogenesis of many diseases. It has been confirmed by various studies that free radicals are involved in the progression of pulmonary tuberculosis (PT), as well as in the damage caused to the lung tissue. The aim of this study was to investigate the serum lipid peroxidant products and important free radical scavenging enzymes i.e. superoxide dismutase (SOD), catalase and glutathione peroxidase (GPx) levels in tuberculosis patients before and during therapy.

Methodology: Total 120 patients with active PT and 60 healthy people as the control group were included in our study. For subjects with PT, the levels of antioxidative enzymes and products of lipid peroxidation were determined twice – first prior to the treatment with anti-tuberculosis drugs and again, three weeks after the initiation of the treatment. The control group had the aforementioned parameters measured only once.

Results: The levels of lipid peroxidation increased significantly in PT patient ($p<0.05$), while the levels of the antioxidants (SOD and GPx) were found to be decreased significantly in PT patients ($p<0.05$ and $p<0.001$) as compared to the control group. The values of antioxidant enzymes increased during the treatment with anti-tuberculosis drugs.

Conclusion: The study showed that the free radical activity is high and antioxidant levels are low in PT patients. The application of the anti-tuberculosis treatment increased the levels of antioxidants.

Key words: Pulmonary Tuberculosis, Oxidative stress, Oxidants, Antioxidants

Introduction

Tuberculosis is a leading health problem worldwide and remains one of the leading causes of death of infectious disease. According to the World Health Organization, tuberculosis is an infectious disease caused by Mycobacterium tuberculosis (M. tuberculosis) which commonly affects the lungs. This disease is characterized by a productive cough, night sweats, fever, chills, chest pain, weight loss, fatigue and anorexia (1). Nearly one third of the global populations is infected with M. tuberculosis. It is estimated that 8.5 million people develop active tuberculosis each year resulting in approximately 2 million deaths. Factors contributing to the resurgence of tuberculosis in developing countries and problems of its control include the co-infection with HIV, the emergence of multi drug-resistant strains of tuberculosis, inadequate treatment, malnutrition, armed conflict and increased number of displaced persons (2).

During cellular metabolism in normal conditions, the lungs are exposed to basal oxidative stress, due to the production of reactive oxygen species (ROS) such as superoxide anion and hydrogen peroxide (H2O2). Human tissues are protected from oxidative damage by a variety of mechanisms including antioxidants like vitamins C and E. If the antioxidant system is inadequate and the free radical level happens to be greater than the antioxidant capacity of the organism, free radical reactions become very toxic and may harm the lungs (3,4).

The increased production of reactive oxygen species (ROS) is a consequence of phagocyte respiratory burst during an infection with M. tuberculosis. The generation of lipid peroxides indicates the extent of oxidative modification of lipids and serves as a marker of lipid-rich particles damage (cell membrane structures or blood lipoprotein particles). Lipid peroxidation is a final step of free radical mediated chain reaction. In lipid peroxidation, a primary reactive free radical interacts with polyunsaturated fatty acids to initiate a complex series of reactions that

result in a variety of degradation products. The uncontrolled peroxidation of biomembranes can thus lead to profound effects on the membrane structure disruption and their functional alteration, being very often sufficient to cause cell death (5). Oxidative stress plays an important role in the pathogenesis of tuberculosis besides other chronic ailments; which can be a result from tissue inflammation, poor dietary intake, free radicals burst from activated macrophages and impaired immunity.

The objective of the present study was to determine the pro-oxidative products (tiobarbituric acid reactive substance - TBARS) and anti-oxidant status: the levels of superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx) in PT patients and the corresponding healthy control group.

Patients and methods

Total of 120 patients with active pulmonary tuberculosis (PT) and 60 healthy people, as the control group, were included in our study. Among the tuberculosis cases, 46 were female and 74 were male. The average age of tuberculosis patients was 52.77±17.07 years. In the healthy control group there were 27 females and 33 males with average age 60.00±6.11 years.

After a detailed history and physical examination, a chest X-ray and routine biochemical and hematological analyses of all cases were performed. Mycobacterium tuberculosis was looked for in sputum smears and submitted for tuberculosis culture in Lowenstein-Jensen media at least 3 times. About 5ml venous blood was collected from each subject after obtaining informed consent. The samples were then analyzed for lipid peroxidation products, superoxide dismutase, catalase and glutathion peroxidase.

For subjects with PT, antioxidative enzymes and lipid peroxidation products were first determined prior to the treatment with anti-tuberculosis drugs, and then again 3 weeks after the treatment had begun. Subjects belonging to the control group had their parameters measured only once.

Estimation of TBARS

The concentration of thiobarbituric acid-reactive substance (TBARS) was determined in blood plasma, by the thiobarbituric acid method (18). Lipid peroxidation products react with thiobarbituric acid in buffer of 1 % orthophosporic acid solution, pH 2.0, and the addition of 1 μmol of iron sulphate. The absorbance was measured at 535 nm (7).

Estimation of Glutathion peroxidase and Superoxide dismutase

Activities of glutathione peroxidase (GPx) (EC 1.11.1.9) and superoxide dismutase (SOD) (EC 1.15.1.1) were determined in erythrocytes with the Ransel and Ransod commercial kit (Randox Lab, UK). These parameters were measured on the Olympus AU 680 analyser (8).

Estimation of Catalase

Catalase (EC 1.11.1.6) activity was determined in erythrocyte with the Beutler method based on the decomposition of H_2O_2 followed directly by the decrease in absorbance at 230 nm (20). Both TBARS concentration and catalase activity were determined by Beckman DU-650 spectrophotometer (8).

Statistical analysis

In order to compare the analyses of data between the experimental and control groups, the Student's t-test for independent samples was used. All the statistical analyses have been carried out using the statistical software SPSS 10-0 version.

Results

There were 46 women (38%) and 74 men (61%) in the study group, while there were 27 women (45%) and 33 men (55%) in the control group. There was no significant difference according to gender between the two estimated groups (p=0.5). The average age of the diseased was statistically significantly lower than that of the subjects belonging to the control group (52.77±17.07vs.60.00±6.11; and p<0.001).

Table 1 illustrates the results of the determined levels of antioxidative enzymes and lipid peroxidation products.

The activity of SOD±SD was 1172.62±313.52 U/g Hb in the TBC group before the treatment was commenced, whereas it was 1283.32±128.83 U/g

Table 1. Comparison between antioxidant level and TBARS in pulmonary tuberculosis patients

Parameters	Tuberculosis patients				Control group		
	Pre- treatment		After-treatment				
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	Sig
GPX	34.78	11.70	36.58	10.78	42.44	8.96	* †
CAT	7.83	3.05	8.48	2.89	7.37	0.95	‡
TBARS	5.24	1.32	5.21	1.14	4.79	1.12	* ‡
SOD	1172.62	313.52	1183.39	286.78	1283.32	128.83	* ‡

*Values are means ±SD *control vs. pre-treatment ; † pre-treatment vs. after-treatment; ‡ control vs. after-treatment*

Hb in the control group, which is a significantly lower value, compared to the values of control group ($p<0.05$). During treatment, the level of SOD increased to 1183±286.78 U/g Hb; however, it still remained significantly lower, compared to values in the control group ($p<0.05$).

The GPx activity of control group was 42.44±8.96 U/g Hb, what was significantly higher compared to the basal activity of group of patients before the treatment 34.78±11.70 U/g Hb ($p<0.001$), as well as compared to the values of GPx activity after treatment 36.58±10 U/g Hb ($p<0.01$). During the treatment, there was an increase in the values of GPx; however, that rise is of little statistic importance.

The values of the catalase activity in patients suffering from TB prior to treatment were 7.83±3.05 U/g Hbx10^4. During the treatment, an increase to 8.48±2.89 U/g Hbx10^4, was registered, but this rise was not statistically significant. The lowest activity was registered in the control group (7.37±0.95 U/g Hbx10^4), which was significantly lower in relation to the values of the same enzyme in the group of PT patients after treatment 8.48±2.89 U/g Hbx10^4 ($p<0.001$).

The average values of TBARS reactive products in PT patients were 5.24±1.32 μmol/L during the first test, 5.21±1.14 μmol/L during the second test and 4.79±1.22 μmol/L in the control group. The statistical significance was observed both, in comparison of control values with the basal (the first) value of PT patients ($p<0.05$) and after the initiation of treatment ($p<0.05$).

Discussion

Free oxygen radicals, known as the reactive oxygen species (ROS) are involved in initiation and/or progression in a number of inflammatory, immune or chronic degenerative diseases. The antioxidant defense system acts as a defender against the ROS for their inactivation and removal. Enzymatic and non-enzymatic antioxidants such as superoxide dismutase, catalase and glutathione peroxidase, uric acid, bilirubin and albumin may act against the ROS and minimize damage to biomolecules (9). The imbalance between the production of ROS and the antioxidant capacity leads to the oxidative stress, which contributes to the pathogenesis of human diseases. The increased production of ROS was documented to occur in pulmonary tuberculosis, taking an active part in the pathogenesis of active pulmonary tuberculosis and in resultant fibrosis (10,11).

A significant reduction in enzymatic anti-oxidants (SOD) and non-enzymatic anti-oxidant (glutathione) was found in our study. Similar results were obtained by Reddy et al.and Mohod et al. (10,11). Our results showed that SOD exerted significantly lower activity in TB patients when compared to its levels in healthy population. Moreover, the study has shown that the time necessary for SOD levels to recover balance was more than 3 weeks, since its activity started to rise three weeks after treatment. However, the activities were still significantly lower than those in healthy subjects, inadequate to counteract increased oxidative stress, manifested by increased generation of lipid peroxidation products (10,11).

Due to extreme exposition of lungs to oxygen, numerous enzyme and non-enzymatic systems participate in the degradation of H_2O_2. The most important of them are catalase and glutathion peroxidase. The main feature of the antioxidative defense of the human lungs is the high level of reduced glutathione system in the fluid which covers the epithelium, almost 140 times higher than in the circulating blood (12). The results of our research have shown

that the level of Gpx was recovered faster during treatment, compared to SOD, but it was still considerably lower than in healthy individuals. Reduced glutathione level indicate the potential oxidative damage to erythrocyte and erythrocyte membrane of pulmonary tuberculosis patients (13).

Alveolar macrophages possess a great ability to produce catalase and use it mostly to neutralize the exogenous H_2O_2 (3). In our research, the catalase activity prior to treatment did not differ significantly, compared to the control group. Nonetheless, catalase activity increased during the treatment and was significantly higher than in the control group.

In the present study it was observed that the total anti-oxidants status was low in TB patients, irrespective of treatment status. The decrease was more pronounced in the untreated TB patients, indicating that the anti-oxidants were nearly completely utilized to scavenge the superoxide free radicals. The results of our study are completely in line with those obtained by Reddy et al.(10) Beside this, several factors, such as low food intake, nutrient malabsorption and inadequate nutrient release from the liver, as well as acute infections and an inadequate availability of carrier molecules may have an influence on antioxidative state in tuberculosis (14,15).

Indeed, free radicals released from M. tuberculosis patients initiate lipid peroxidation by attacking polyunsaturated fatty acids in cell membranes, converting them to lipid peroxides and to variety of secondary metabolites (15). The uncontrolled peroxidation alters membrane fluidity and permeability. Hence, the lipid peroxides and their secondary metabolities such as thiobarbituric acid-reactive substances (TBARS) are then transported through the circulation by lipoproteins causing damage at distant tissues (16,17,18,19). In our study, it was documented that there was a higher level of lipid peroxidation products in TB patients both in the first and the second screening when compared to the control group. However, the level of TBARS decreased after 3 weeks' treatment, but remained considerably higher than that of the control group. Hence, the extent of lipid peroxidation may be decreased due to chemotherapeutic destruction of mycobacteria. This is in line with the results obtained by Johnkennedy et al. and Madhab et al. who found considerably higher values of lipid peroxidation products in TB patients (17,20). Makinski et al. showed that the high pretreatment levels of ROS had decreased to the normal at the end of treatment in active pulmonary tuberculosis patients (6).

In conclusion, the findings from our study further support a substantial pathogenetic link between oxidative stress and tuberculosis infection and me be a useful marker of the disease severity. The recovery of antioxidative enzyme defense system after the initiation of anti-tuberculosis treatment, means they can be reliable markers of the course of long-term disease regression.

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The effect of oral fluid food support during labor on labor duration and perception of labor pains

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Abstract

Intoduction: This research was conducted to determine the effects of oral fluid foods intake during labor on duration of labor and perception of labor pains.

Methods: The study included 110 low risk nulliparous labouring women (55 intervention, 55 control group) who were matched by age and education. Women in the intervention group were allowed to drink fruit juice "as much as they want, whenever they want" during labor. Data were collected by using data collection form about demographic characteristics of women, evaluation and diagnosis form of labor and Visual Analog Scale (VAS).

Results: Mean of duration of labour was 489 minutes in the intervention group, 604 minutes in the control group (p=0.016). The mean of VAS score in the first stage of labor was found 4.1 in the intervention group, 3.3 in the control group (p=0.468). The mean of VAS score in the second stage of labor was 9.8 in the intervention group, 9.7 in the control group (p=0.696). The mean of VAS score in the fourth stage of labor were 4.1 in the intervention group, 3.3 in the control group (p=0.109).

Discussion: In our study, It was found that oral fluid foods intake during labor was shortened duration of labor and was not influence perception of pain.

Key Words: Drinking, Labor Duration, Labor, Labor pain.

Introductıon

Birth is a physiological process in which women need as much power as an athlete needs in a race. Glucose and oxygen consumption of a mother rises during labor. Accordingly, it is also important to provide mother with enough energy besides preparing her to the labor and adapting her to it. Hodnett[1] offers that modalities such as providing the need of food & beverage can be as effective as oxytocin when a reinforcement is needed in labor. There is very little information in the literature about the need of food intake during labor (2-4).

Restricting oral intake or nil by mouth it is a way of nursing care which has been applied since 1940 and advantage or disadvantage of which hasn't been proved yet (5-7). Restricting or fasting of it is based on the theory of Mendelson, 1946, which suggests that the delay of emptying out the stomach contents in labor causes aspiration pneumonia and also acidity of the stomach contents dermines the risk of mortality and rate of maternal complications (8).

It is known that fasting during labor doesn't quarantee an empty stomach and some contents will still remain. For this reason, during anaesthetization, techniques such as cricoid pressure is applied to prevent inhalation of acid during intubation, even though women are fasting (9-12). Analysis of aspiration incidences shows that whole cases are caused by malpractice. Besides, in recent years, general anesthesia is preferred instead of epidural anesthesia (6,13-14).

Arguements about whether women should eat during labor or not still continue. Two different subjects are at center of discussion (15). The first one is, as mentioned rather by anesthetists, the possibility of complications as a result of the aspiration of the stomach content when general anesthesia is performed. Especially, in case of emergency, when general anesthesia is a must, it is stated that the risk of regurgitation and aspiration rises in women who eats during labor. The second one is the belief that drinking and eating during labor causes damage to women, fetus and the labor. This opinion is argued by some midwifes and some obstetricians (7, 16-18).

In different centers of United States of America, Canada, England, Australia and quite a few European Countries, eating things like biscu-

its, honey, yogurt and drinking weak tea, water, etc. are allowed during labor (18-20). According to written policies and clinical practice guides, allowing pregnant women to eat ice chips and take sips of water during labor are the applied practices (21-24). But most of the hospitals lack those written policies and clinical practice quides or these quides are not given the proper consideration. Applications differ according to whether the pregnancy is low-risk or high-risk and whether the act is latent or active phased (18). American Anesthesiologists suggest that clear liquids can be given to very low-risk pregnant women during labor but giving solid food is not recommended (21). Canada Society of Obstetricians and Gynecologists has the view that light diet or liquid diet can be offered during the labor so, women can choose one (23). Despite the moderate views of recent years about food and fluid intake, in some countries, women are still prohibited from eating and drinking in labor (19-20,22,24). In these countries food and fluid intake is prohibited or restricted or limited to ice chips and sips of water (22,24).

Restriction of food and fluid intake of women during labor may cause ketosis, prolonged labor, dehydration, need of assistance during labor and postnatal drips allied to ketosis, Reduction in blood glucose level negatively effects the respiration and activity of fetus (25-28). It is known that intravenous(IV) treatments done in order to prevent ketosis causes: Hyponatremia, hyperglycemia in mother, iatrogenic hyperinsulinemia in fetus due to hypoglycemia in newborn baby, reduction in serum pH in fetus and increase in fetal lactate level. Increase in the stress level of women due to fasting also increases the depth of ketosis. At the same time, fasting affects pain perceptions so women suffer headache, nausea, limitation of movement ability and local pain in catheter place. All these negative situations make it difficult for women to adapt to labor (25,28-29).

In our country, Turkey, it can be observed that the common practice is nil by mouth and there is also no research study about the subject. This study was done in an attempt to share the view that light drinking during labor prevents potential complications of pregnant women. The aim is to determine the effects of drink intake on labor and early post-partum period.

Materıal and method

The study is a comparative researh including intervention group and control group. Population of the study was pregnant women who applied to a Women's Health Training and Research Hospital at the center of the city Ankara between February 2007 and September 2007. The study was comprised of two groups [intervention group(I): the group that was supported by liquid intake during labor and control group(C): the group treated by relying on the policies and practices of the mentioned hospital]. These two groups both consist of 55 women who undergo pregnancy without complications, who were with single pregnancy, without abnormal presentation, women for whom cesarean section is not a planned and low risk nulliparous women with servical dilatation of not more than 4 centimeters.

According to Turkish Population and Health Research Analysis Results, prevalence rate of prolonged labor is 36% (30). The sample size was measured by using NCSS - Statistical and Power Analysis Software -PASS one-to-one match, Mc. Neamer test method. Longer labor occurence rate of the control group was 0.365 and longer labor rate of the intervention group was 0.165. According to Mc. Neamer test, it was found out that to test the hypothesis of reducing time of labor to normal level, 55 people were needed in α=0.01, for a test strenght of 1- β=0.70. Accordingly, 55 women for intervention group and 55 women for control group were within the scope of the research. These 110 women were one to one matched on age and education.

Preperation of the liquid: Researches that in the relevant literature were investigated especially by giving importance to these subjects: food intake during labor, how often this support was given and how many calories this support have (2,6,19-20,26,31). A specialist in the field of nutrition and dietetics was consulted to tell opinions. In direction of the suggestions, usage of grape juice was chosen to be used as it was a high calorie and low volume drink (64kcal/100mL).

Data collectione: Data collection forms, labor evaluation forms and diagnosis forms were developed by the present researchers after evalution of the relevant literature (18,20,26-27,31). These

forms' content validity was investigated by three experts for general appropriateness and applicability before the study was conducted. In addition, to define the perception of pain during labor, Visual Analog Scale (VAS) was used. VAS consists of an ungraduated, straight 100 mm line marked at one end with the term " no pain" and at the other end "the worst possible pain". The patient marks on the line the point that they feel represents their perception of their current state. The VAS score is determined by measuring in millimetres from the end of the line to the point that the patient marks. This measures the intenseness of pain (32). Kilocalories were calculated according to the amounts of total intravenous fluids and fruit juice which given to women during labor. The first researcher was present with both the intervention and control groups during labor.

Intervention: Pregnant women who applied to the hospital were analyzed in accordance with sample selection criterias. The pregnant women who match the criteria were informed and their written permissions were received. Grape Juice was given to pregnant women in the intervention group "as much as they want, whenever they want". It was stated that they could drink grape juice and the amount of juice they intake was constantly evaluated.

Ethical Approach: The study was started following the approval of the institutional review board of Hacettepe University's Medical Faculty. The participating women also provided written consent after the aim and method of the study had been explained.

Analysis of the Data: The SPSS 11.0 software package was used for statistical analysis. The chi-square test, t test, were used for statistical analysis, as appropriate. The distribution of the data was expressed as counts and percentages. A *P*-value of less than. 05 was accepted as statistically significant.

Results

Fifty five women from intervention group and fifty five women from control group (Total 110 women) were included in the research. They were one to one matched on age and education. 14.6% of them were between age of 18-19, 61.8% of them were between 20-24 and 23.6% of them were between age of 25-29. 18.2% of the women were primary school graduates, 32.8% of the women were middle school graduates, 38.2% of them were high school graduates and 11% were faculty or college graduates.3.7% of the women in the intervention group were at 38th week of gestation, 30.9% of them were at 39th week of gestation, 30.9% of them were at 40th week of gestation and 34.5% of the pregnant women in the intervention group were at 41th week of gestation. 98.2% of the women and their spouses, in both intervention and control groups, wanted to have the baby. The two sample groups are similar in respect of age (X^2=0.309; p=0.857), education status (X^2=0.00; p=1.000) and gestational age (p=0.974).

When distribution of the mean of liquid and calorie intake was analyzed in both groups, it was seen that calorie intake of women in the intervention group was 291.9 kcal. and this number was 154.4 kcal. in the control group. The difference between mean calorie intakes was statistically significant(p=0.001). But the total liquid intake in the intervention group on mean was 968.1mL, in the control group this amount was 966.9 mL (Table 1).

In the intervention group, labor duration was approximately 489 minutes (8:15 hours). While for the control group, labor duration was 604 minutes (10:06 hours). Labor duration difference between the groups was found statistically significant on behalf of the intervention group (p=0.016) (Table 2).

In the first stage of the labor, the mean score of pain perception was 6.7 in the intervention group and 6.3 in the control group. It was found out that

Table 1. Fluid & Calorie Intake of Women During Labor Distribution of Means According to Intervention and Control Groups

Liquid and Calorie Amounts	Intervention			Control			Statistical Values	
	n	$\bar{X}$ ± SS		n	$\bar{X}$ ± SS			
Calorie Amount (kcal)	55	291.9	194.3	55	154.4	146.3	t=4.191	**p=0.001**
IV Fluid Amount (mL)	55	714.0	474.1	55	966.9	693.8	t=2.232	**p=0.028**
Oral Intake of Liquid (mL)	55	254.1	180.9	-	-	-		

Table 2. Distribution of the Labor Duration Mean

	Groups				Min.	Max.	Statistical Values	
	Intervention		Control					
	n	$\bar{X} \pm SS$	n	$\bar{X} \pm SS$				
Labor Duration (minutes)	46*	489±235	44**	604±205	105	1118	t=-2.46	**p=0.016**

* *Delivery by caesarean section is performed for 9 women in the intervention group.*
** *Delivery by caesarean section is performed for 11 women in the control group.*

Table 3. Distribution of Mean Scoreof Pain Perception in Stage first, second and fourth stage of the Labor

Stages of the labor	Pain Score						Statistical Values	
	Intervention			Control				
	n	$\bar{X} \pm$	SS	n	$\bar{X} \pm$	SS		
The first stage	55	6.70	2.12	55	6.37	2.56	t=0.729	p=0.468
The second stage	47	9.82	0.52	46	9.73	1.49	t=0.391	p=0.696
The fourth stage	46[a]	4.11	2.20	44[b]	3.30	2.55	t=1.618	p=0.109

[a] *Delivery by caesarean section is performed for 9 women in the intervention group.*
[b] *Delivery by caesarean section is performed for 11 women in the control group.*

in the second stage of the labor the mean score of pain perception were 9.8 in the intervention group and 9.7 in the control group. In the fourth stage of the labor, the mean score of pain perception were 4.1 in the intervention group and 3.3 in the control group. In all stages, the difference between the groups in terms of the mean score of pain perception was found non-significant (The first stage: p=0.468; the second stage: p=0.696; the fourth stage: p=0.109) (Table 3).

Discussion

The forces that enable labor are uterus contractions. For those contractions to be effective, it need to be strong, regular and periodical. When uterus contractions don't fit this criteria, fetus can not descend into the pelvis and cervical effacement and cervical dilatation and the labor takes longer than expected or dystocia occurs (7,16).

With the help of contractions, head of fetus reaches vaginal aperture and pregnant woman gives birth to her baby. In order for all these things, for contractions, for adaptation labor, for breathing exercises and for propellant force needed, women need energy (16). Despite there is no updated information about the energy need during labor, recommended calorie intake is 50-100 calories/ per hour (2). Because it is thought that not having enough energy causes prolonged labor.

The mean duration of labor was 489 min. ±235 for the intervention group and 604 min. ±205 for the control group in the study, with statistically significant difference between the groups (p:0.016). In various studies researching effects of food intake on duration of the labor, various results are found. Some studies identified that there was no effect of food intake on duration of the labor (26,33-34). Whereas some studies said that it prolonged the labor (4,35-36) and one of them states that it shortened the labor (37). In a research conducted by Al Olaimat (37) in the Hashemite Kingdom of Jordan, 390 women were allowed to intake light beverages or food during the birth process and 1950 women who were in control group were recommended to fast in accordance with the hospital practices. The research stated that the second stage of the labor was shorter in intervention group when compared to control group. Our study also showed that the labor was shorter for women in intervention group who were allowed to drink fluid.

Contrary to our study, Scheepers et al.(4), Parsons et al.(35), Parsons et al.(36) found out in their researches that women who were allowed to eat and drink had experienced longer labor when compared to the control group. Studies of O'Sullivan et al.(34) and Scrutton et al.(33), Tranmer et al.(20) Kubli et al. (26) didn't state any difference between the group of women who oral intake and the control group.

As it is seen, effects of food intake on labor duration varies in different studies. The fact that there are lots of different findings on the subject is thought to be due to different quantities of the samples and the fact that they are found by using different methods as it is explained above.

Labor is one of best known and identified source of pain in our day. It is identified that 60% of the primiparous women and 40% of the multiparous women experience high level of pain. However, pain is not a simple result of the physiological process of labor. Pain in labor is a complex result which is affected by various factors in accordance with physical and emotional stimulatives that is experienced by every women (38). For this reason, some women experience high level of pain during uterus contradictions while others feel less pain. Various factors such as cultural differences of women, their religious beliefs, previous pain experiences, the methods they use to cope with pain, loneliness, unsolved psychological and physiological problems, undamped stress affect our perception of pain (39).

In our study, pain level experienced by women increased as the stage of labor progressed. In all stages of the labor, the women in the intervention group (the first stage: 6.70±2.12; the second stage: 9.82±0.52; the fourth stage: 4.11±2.20) experienced more pain than the women in the control group (the first stage: 6.37±2.56; the second stage: 9.73±1.49; the fourth stage: 3.30±2.55). It is accepted that women with high energy relax physically and psychologically and they are more likely to adapt to the labor. Adaptation to the process is expected to help especially control breathing and it enhances oxygenation of uterine tissues so perception of pain decreases. However, this differences between the intervention and control groups are found statistically nonsignificant (for the first stage p:0.468, for the second stage p:0.696, for the fourth stage p:0.109). Klassen (40) analyzed the pain after cervical dilatation in his study that observed restricting liquid intake/ effect of the pain and control perception in multiparous women and found that, similar to our study, pain level increased as the labor progresses and there was no difference between intervention and control groups. The fact that there is no finding about the difference between groups in terms of pain perception score mean is thought to arise from the effects of some other factors.

Conclusıon

In our research it was found that liquid foods intake shortened duration of labor but there was no effect of it on pain perception. However, in these studies was done by allowing oral intake in labor it could be seen that there were conflicting results about the duration of the labor**.** For this reason, these are suggested to be done; Studies that observe wide-ranging groups and studies done in order to observe the effects of liquid intake on mother and newborns,

In the study, women in the control group stated that they reported higher score of pain than the control group during the fourth stage of the labor. Therefore this situation, although it is found statistically nonsignificant, should be studied using wide-range of groups as sample,

Women in the intervention group intake approximately 292 kilocalories while women in the control group intake 155 kcal. There are some studies in the literature done in order to determine the energy need of women in labor. Some studies that aim to determine the need of energy during the process should be planned and those studies should be supported by laboratory findings.

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Using Project Management as a Way to Excellence in Healthcare

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Abstract

Health care institutions are coping with growing demands coming from the fast changes of the environment related to technology, costs, personnel etc. Therefore they are seeking for a new management approaches day to day. Various attempts all over the world have been made in order to enhance management in healthcare. However, there are no proper solutions yet. Project management was originally applied in the areas of construction, engineering etc. Academic research in the UK and other countries points out increasing numbers of new developments and new initiatives being pursued through projects and programmes. Project management is no longer just a sub-discipline of engineering, the management of projects – including programme management and portfolio management – is now the dominant model in many organisations for strategy implementation, business transformation, continuous improvement and new product development. Project management has extensive current opportunities and a bright future. One of the very important areas where it starts to find its application is certainly healthcare. There were some attempts both practical and theoretical to apply Project management in a healthcare (also published in Journal of Evaluation in Clinical Practice). This paper is trying to go deeper and to apply project management methods in every aspect of clinical practice. The pilot project was conducted on inguinal hernia surgery that was organized as a project and showed substantial results in terms of organizational enhancement. Therefore, one may conclude that the discipline of project management is emerging in healthcare institutions and it could significantly help improving efficiency of medical organizations.

Key words: project management, healthcare, efficiency

1. Introduction

Project management is not a new discipline any more. However it is still mainly connected with the traditional areas of application such as civil engineering, IT etc. When someone says project, one usually thinks of a building, bridge, industrial plant, damn or other big infrastructure endeavour. But this approach is way behind modern management.

Health care institutions are coping with growing demands coming from the fast changes of the environment related to technology, costs, personnel etc. Improvement in the technical efficiency of hospitals may result in large savings in healthcare expenditures, which might, in turn, be devoted to other services such as prevention and education (Munkhsaikhan, Sodnom; Tsai, Alan C; Chang, Ming-Cheng;, 2011). Therefore they are seeking for a new management approaches day to day. Various attempts all over the world have been made in order to enhance management in healthcare. However, there are no proper solutions yet.

This paper advocates a new managerial approach: application of a project management in a healthcare systems and creating a new specialized discipline: medical project management.

2. Project management: from infrastructure to healthcare

2.1 History

Projects can exist in every sector, including retail, insurance, banking and transport. The vision of a project oriented organization is increasingly widespread in all sectors. Non-profit organizations such as institutions in the health care and public sectors have now also discovered project

management. However, they seldom apply it due to the constraints imposed by their operating environments, such as the prevalence of legalistic attitudes and the lack of a business – oriented approach. This especially applies in the public sector (Schelle H., Ottmann R., Pfeiffer A., 2006).

Project management has become institutionalized in the past decades. Originally applied in the area of construction, engineering and data processing project management (Schelle H., Ottmann R., Pfeiffer A., 2006) has penetrated rapidly in R&D environments, manufacturing, administration, etc. Gareis point out that in addition to construction and R&D projects, strategic planning, marketing and organizational developments are also increasingly carried out using a project approach (Platje A., Seidel H., Wadman S. 1994).

Kloppenberg and Opfer(Kloppenberg, T.; Opfer, W.A. 2002) identified project management research published in articles, papers, dissertations, and government research reports since 1960. They found that emphasis moved from development and use of automated project management software and tools to risk management and earned value management and then to human resource aspects. They also determined that research focus moved from large government defence projects to commercial applications in construction, information systems, and new product development. They concluded that project management has extensive current opportunities and a bright future (Kwak, Y. H.; Anbari, F. T. 2009).

The world is undergoing increasingly more rapid changes, and this storm of change affects all countries in significant ways. Rapid developments in technology, ever growing competition, high quality turning into a standard feature for all organizations, and the changing and increasing expectations require organizations to make a production "that is fast, high-quality, and that makes a difference" (Yılmaz , Kürşad; Altınkurt, Yahya;, 2011). One of the most important organisational developments in recent years has been the significant growth in project work across different sectors and industries (Winter, M.; Smith, C.; Morris, P.; Cicmil, S. 2006). Academic research in the UK (Whittington R. 1999) confirms this trend, which looks set to continue with increasing numbers of new developments and new initiatives being pursued through projects and programmes. Recent industry reports, e.g. (KPMG 2002) also highlight the growing adoption of project management standards and practices across large numbers of organisations, including the creation of project management centres of excellence within UK government departments (OPSR 2003). No longer just a sub-discipline of engineering, the management of projects – including programme management and portfolio management – is now the dominant model in many organisations for strategy implementation, business transformation, continuous improvement and new product development.

2.2 Problem

The management of health care organizations is becoming a more and more demanding and complicated task (Kouria, Karjalainen-Jurvelinb and Kinnunenb 2005). Traditionally, European public hospitals were funded and directed by government institutions (Kemenade YW van 1997). The spending for health sector exceeds 4,7 trillion USD and managing of organizations within this sector is certainly a challenge (Pijalovic and Kudumovic 2010). There was no need for these organizations to compete for funds and to develop a detailed accounting information system since costs were hardly ever an issue.

As a part of the health sector reform in developing countries, Ministries of Health have been urged to enhance health care through greater community governance and improved management effectiveness in their public hospitals (McPake, 1996; Mills et al., 1997; Collins and Green, 1999; Collins et al., 1999). Some Canadian studies found similar limited integration between care providers and facilities (Chapman 1998) that had resulted in late referrals, unnecessary delays for treatment or transfer to an appropriate setting of care, and unnecessary suffering and cost (Johnston, Gibbons and Burge 1998), (Chapman 1998).

The most commonly reported management problems include lack of financial resources, medical equipment, supplies, and drugs; lack of staff motivation; absence of trained personnel; lack of community participation; and lack of a national policy on hospital management. Resources, such as money and personnel, are limited (Loo R. 2003),

(Lodder and Bakker 2000), (Aroian, et al. 1997), (Özkahraman , Şükran; Özsoy, Süheyla Altuğ;, 2011). Medical directors further noted that the most difficult areas to manage were human resources, administration, and budgeting (Hartwig, et al. 2008).

Various activities and health research are available to assist public health policy and clinical decision making with the purpose to organise and provide health services more effectively and efficiently. Many studies have been carried out to assist health system managers in making decisions, enabling them to evaluate the consequences produced by their choices in the efficacy and the efficiency of the system (Flessa 2000), (van Zon, A. H.; Kommer, G. J.; 1999). Health system managers are in charge of making the best possible decisions, despite the restrictions—characterised by budget limitations—imposed by the environments in which they operate (De Angelis, V.; Felici, G.; Impelluso, P. 2003). Starting from different perspectives, the main objective is to improve the health care systems' performance measured by criteria related to for example safety, efficacy, effectiveness, costs, cost effectiveness and appropriateness of health care interventions as well as the quality of health care and the perception of the public (Perleth, Jakubowski and Busse 2001).

There were many various attempts across countries and continents to enhance management of the healthcare organizations. In countries like USA, UK, New Zealand, Canada, Afghanistan, India, and China there have been several attempts to implement different business-proven management models into healthcare from Balanced Scorecard, through benchmarking and best practises to various ICT support systems (Krakauer, et al. 1998), (Peters, et al. 2007), (Perleth, Jakubowski and Busse 2001), (Hartwig, et al. 2008), (Sinha, et al. 2007), (Kouria, Karjalainen-Jurvelinb and Kinnunenb 2005), (Edwards, N.; Roelofs, S. 2006). There are few studies from developing countries reporting efforts to improve quality of care through hospital management efforts (Mills et al., 1997; Collins et al., 1999; Smits et al., 2002; Berwick, 2004; Garcia-Prado and Chawla, 2006), although small-scale interventions have reported positive effects from public reporting of quality indicators (Bouchet et al., 2002), voluntary hospital accreditation processes (Bukonda et al., 2002), and hospital-specific quality improvement efforts (Mills et al., 1997; Collins et al., 1999; McNamara, 2006).

From the healthcare manager's standpoint, efficiency is often measured by the cost of providing a given level of service. Users of health services, on the other hand, in addition to requiring a good quality of service, desire prompt attention; i.e., not having to wait in queues on the health service premises, or at home (waiting for admission to a hospital to undergo treatment). The satisfaction of this expectation is even more important for users who are not patients but, rather, volunteers donating blood at transfusion centres, taking time out of their everyday activities (De Angelis, V.; Felici, G.; Impelluso, P. 2003). Therefore a new more widely oriented managerial approache needs to be introduced.

2.3 Hypothesis

There has been a long debate in the management education community as to whether ''project management'' is a practice or an academic discipline. In the R&D field, tools and techniques of project management are applied and implemented to complete complex projects successfully. In the construction engineering and management discipline, people learn and implement planning, managing, and controlling of engineering construction projects to meet the time, budget, and specifications. In the engineering field, production planning, scheduling and quantitative methods are applied to manufacturing systems to achieve higher productivity. However, when it comes to the business and management field, scholars often appear puzzled and unconvinced of the notion ''project management''. The origin, history, and evolution of project management, and its academic background, foundations, and underlying theory, have been debated and studied only to a limited extent from the management field's academic perspective, and supporting literature is limited. As a result, previous research had limitations to transfer the message outside of the project management field to the broader business and management academic audience (Kwak, Y. H.; Anbari, F. T. 2009).

During the last decade, as a response to the need for inter- as well as intra-organizational integration, management models initially developed

for industry have been spread to healthcare organizations (Fa ltholm, Y.; Jansson, A. 2008), mainly because of the increased demands for health care services and the need to cut costs (Fotaki, 1999; Brown et al., 2003; Olsson et al., 2003; Tra¨ga˚rdh and Lindberg, 2004; Berkeley and Springett, 2006) and it is shown that project management methodology can help in cost cutting in various industries (Semolic, et al. 2008) and especially in healthcare (Sa Couto 2008).

During the last decades, as a response to these needs, management models, such as Total Quality Management (TQM) and Business Process Reengineering (BPR), which initially were developed for industry, have been spread to and adopted and implemented by health care organizations (Ska˚le n 2004).

Health care organizations have become more professionalized, specialized, and differentiated. This is of course a development that in many ways has favoured both patients and the medical profession (Freidson 1970), but with the introduction of management models, comes the need for intra-organizational integration, coordination and collaboration, and the need for a system not only to built upon functions and medical specialties, but also upon processes and multi-professional collaboration in teams.

The main aim of various management approaches in healthcare is improvement of population health resulting from the use of effective and cost-effective health care interventions. This could be divided into immediate objectives (e.g. improving safety, efficacy, appropriateness) and on long-term outcomes, such as life-expectancy (Perleth, M.; Jakubowski, E.; Busse, R. 2001).

Having in mind all previously stated: the increasing need for management enhancement in healthcare and rapid spread of project management as a widely practise-proved approach, one may state that: application of project management approach can improve efficiency of health care systems, which would be the main hypothesis of this paper.

Every good project addresses a practical problem or a recognized need (Lodder and Bakker 2000). Project management and leadership are very important in order to keep all human activities directed toward the implementation of the project (Trish J.; Tanner L., 2004), (Dienemann J.; Van de Castle, 2003), (Loo R. 2003), (Perala 1998), (Aroian, et al. 1997), (Keillor A.; Nutten S.; 2000). Project management is also a critical element of successful donor-funded health projects (Edwards, N.; Roelofs, S. 2006). Therefore it could be widely applied in the health sector as well.

3. The case of inguinal hernia surgery project

Health services providers mostly have traditional and as previously mentioned not very efficient way of organizing their operations. Based on theoretical research and hypothesis that project management could improve operations of healthcare organizations, a pilot project was conducted. Project in healthcare can be divided into three major groups: infrastructure projects, business projects and medical projects.

Infrastructure projects are related to big endeavours like building a hospital, new wing of a hospital, roof repair, renovation, or something similar. Business projects are projects like introducing quality system, implementing new software, organizing some special event, implementing various changes etc. It is obvious that project management as a discipline could (and must) be easily applied on such projects. However, what is more challenging and in the focus of this paper is project management application on medical projects. Medical projects are operations directly connected to the medical activity i.e. surgery, various examinations, recovery etc.

Therefore, a pilot project was conducted in order to test the effects of project management concept in medical projects. The project was related to inguinal hernia surgery. This operation presents a standard and not especially demanding intervention, and thus was recognized as a good choice for the pilot project. Starting from the standard project management approaches, the objective was first to be defined: to carry out the intervention in the best interest of the patient's health in the shortest possible time, with minimal use of hospital resources. The project team was created, that consisted of:

1. Specialist in general surgery,
2. Specialist in medical biochemistry,
3. Internal medicine specialist,
4. Specialist pneumophysiologist,

5. Specialist anaesthesiologist,
6. Nurse,
7. X-ray technician,
8. Instrumental technician and
9. Laboratory technician.

The project manager and project team together compiled a list of activities to be undertaken in order to achieve the goal of the project. Estimated durations were assigned to activities and interdependences were determined based on empirical data and standards. Resources were assigned to each of the activities and actions. Then, the specific responsibilities of team members for each activity were determined and allocation of equipment to be used for certain activities and assessment supplies and medications was conducted. Based on all this, the project plan was developed as shown in Figure 1.

In addition to the given project plan, a number of other planning documents that are used to make better management decisions was developed. In addition to that, in planning and implementation stages, a large number of systematic and readable reports could be defined that display the most important information on the status of the project parts or project as a whole. Special attention needs to be paid to cross cultural aspects of the project's stakeholders in order to optimize project efficiency (Jovanovic, et al. 2009).

Based on a detailed plan, an intervention was carried out and several benefits of project oriented approach were determined:

- Time and resources were used more efficiently which resulted in lower costs;
- Better communication among the personnel involved in the project;
- The basis for better allocation of resources (human and material) was created.
- The basis for further improvement of future operations of this kind.

From the fore mentioned benefits one may say that the improvements could be both hard (time, money, resources) and soft (communication, learning). It is very important to emphasize soft skills improvement such as communication since these were recognized as drawbacks of medical stuff (Karaoglu and Seker 2011). Although during the

Figure 1. Inguinal Hernia Surgery Project Gant Chart

preparation and implementation of the project there were some challenges, primarily related to resistance to change due to the lack of project knowledge, tradition and lack of preparedness for this change, one can freely say that the pilot project was successful and fully justified the expectations.

4. Discussion

Management in the health sector is dyed with double complexity. First of all, there is a significant complexity that comes from complex medical claims. In addition, because of all the intense changes and growth of competitive pressure both locally and globally, at health facilities are put a growing management challenges in the context of increasing productivity, reducing costs, optimizing resources and so on. That is why modern managers in the health care need a new approach for the new era that will offer solutions to the above requirements.

This paper advocates the application of project management in the health and stands for development of a new and a highly specialized discipline - medical project management. Areas of application of this approach in healthcare institutions can be grouped into three major segments:

- Infrastructure projects in healthcare,
- Business projects in healthcare, and
- Medical projects in healthcare.

The benefits realized by applying the methodology of project management in health care have a double effect: better services for users of health services and effective management of health institutions. Based on the theoretical research on project management and completion of the pilot project, the following main features and benefits of applying this approach in health care could be drawn:

- Better time planning and monitoring,
- Better resource (personnel, material etc.) planning and monitoring,
- Better cost planning and monitoring,
- Resource usage optimisation, especially the expensive ones: specialists and equipment,
- Risk management,
- Knowledge management,
- Learning for individuals and the organisation
- Team work,
- Basis for commissioning and procurement,
- Communication enhancement,
- Better monitoring, reporting and evaluation,
- Basis for motivation system,
- Basis for better stakeholder management,
- Reduced probability of management omissions and mistakes.

In order to implement the project approach in health care institutions, specific challenges identified in this phase of the project which are to be expected in most projects and organizations need to be overcome. These challenges can be classified into several basic segments:

- Lack of systematized historical data on the time and resources usage allocated to specific activities,
- Insufficient knowledge of project methodology by the medical staff,
- Tradition as a source of resistance to change,
- Inadequate software support.

On the basis of identified uses, it is clear that this approach can be applied in the health sector very successfully. Accordingly, it is necessary, in an organization that is committed to increase of its efficiency which is one of the main challenges in an ever deeper competitive environment, to implement the following steps:

- Decide to start using the project management approach,
- Opt for the approach or methodology to be used,
- Train people in relation to project management,
- Identify a groups of projects undertaken,
- Develop templates for each group or type of projects,
- Provide adequate software support for the implementation of the new approach,
- Incrementally start applying the project approach,
- Based on lessons learned, constantly improve procedures, templates, and people.

The actual steps may certainly go beyond ones mentioned here, but this should represent the main path to successful medical project management, that would eventually bring medical institutions to a new efficiency and hence competitiveness level.

5. Conclussion

Project management has found applications in many areas of modern society. Application area is growing from day to day. The projects are not any more only spoken about in the context of large construction or military projects but also in the context of the IT sector, pharmaceuticals, non-governmental sector and so on. There is some evidence that the project management has found his modest but successful implementation in healthcare establishments. However, this application is related primarily to the conventional concept of projects. If one wants to keep up with the environment and the development of science, it is necessary constantly to explore new fields of application of this so many times proven managerial discipline.

This paper elaborates the hypothesis that project management can improve management in the health sector. Based on in-depth research literature on project management and governance in health, a confirmation of such theoretical possibilities has been reached. The pilot project was implemented showed that the initial assumptions were justified and that the hypothesis is confirmed.

Features and benefits of applying this concept are numerous and are listed in the paper. However, although at the global level this approach could save billions of dollars that will result in better quality or higher volume of provided health services, one should not foster unrealistic expectations that this concept can be applied overnight. A strong understanding of the local health care system, the underlying determinants of health, and existing capacity and training needs of health care workers to implement project activities is fundamental to appropriate project design (Edwards, N.; Roelofs, S. 2006). On the project road there are many challenges that require a great determination, work and training. But a thousand miles journey begins with one step, so it's time that health care organizations decide to make the first step.

Acknowledgements

This paper has been developed under Project No. 179081 named „Researching contemporary tendencies of strategic management using specialized management disciplines in function of competitiveness of Serbian economy", financed by Ministry of education and science of Republic of Serbia.

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The level of adenosine deaminase in the serum of patients who have positive Entamoeba coli

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Abstract

Aim: The entomoeba coli which is an intestinal parasite is known as apatojen. However in some studies it has also been reported that it may be pathogenic. The Adenosine deaminase (ADA) is the key enzyme of purine metabolizm and controls the levels of adenosine and deoxy adenosine in the cell. The researchers have found that ADA is a marker of cellular immunity and the increased ADA serum in different diseases. In the study the comparison of ADA levels between the serums of the patients with detected *Entamoeba coli* (*E. coli*) and the control group is purposed.

Methods: In this study the levels of ADA in the serums of 40 control groups and 35 patients who have *E.coli* are measured. When comparing the averages of the patients and control groups, the independent sample T test was also used. The mean age of the group is 37.97 ± 5.06, 31 (89%) male and 4 (11%) of them are women. The mean age of healthy 40 people is 40.23 ± 7.01, 31 (77%) males and 9 (23%) of them are women.

Results: In the study according to the controls a significant increase is observed in ADA activity of the patient group.

Conclusions: The findings seem to support the parasite's pathojen. In the studies which will be planned to determine whether the parasite is pathogenic or not, the detection of ADA values of *Entemoeba col*i diagnosed patients' before and after treatment will be guiding. In addition, the determination of ADA levels can give information about the immune mechanisms and we also can reach a conclusion that it can support the criterias for diagnosis and treatment of patients with positive *Entemoeba coli*.

Key words: *Entemoeba coli*, Adenosine deaminase, Intestinal parasite, Pathogen,

Introduction

It was found that the prevalance of intestinal parasites could be risen up to 100 % in the societies living in tropical and subtropical regions and don't pay attention to general hygiene rules. The entomoeba coli which is an intestinal parasite is known as apatojen. But it has been reported that it may be pathogenic parasite, because in some studies E. Coli was found in the tests of patients admitted to health facilities with symptoms of the digestive system but the known pathogenic bacteria wasn't detected in them.[1-4]

The defense of the host immune system against the parasites (adult and larval form) is made through the cells. In this mechanism different cytotoxic agents produced by the fagositer cells that has been activated, reactive oxygen and nitrogen intermediate products are involved. These products are oxidant molecules in the nature of free radical and they affect negatively the parasite viability. Antioxidans are molecules that can neutralize free radicals by accepting or donating an electron to eliminate the unpaired condition. [5-8]

It has been reported that the tissue injury formed in the parasitic infections occurred with the effect of the toxin secreted by the organisms. It has also determined that the parasites contain the enzymes producing free oxygen radicals such as süperoksid and hydrogen peroxide.[5]

The Adenosine deaminase (ADA) is the key enzyme of purine metabolizm and controls the levels of adenosine and deoxy adenosine in the cell. The adenosine deaminase is an amino hydrolase enzyme that catalyzes only the adenosine, the deoxyadenosine and the known ribozids in mammals and it is in multiple molecular forms in human tissue and its structural gene is located 20th chromosome. [9-12] The ADA activity in the Lymphocytic cells are

10 times more than in erythrocytes.[9-12] The T lymphocyte ADA activities are higher than the B lymphocytes and during the T- cell differentiation there is a significant increase in the activity of the ADA, especially in the oimmature and undifferentiated stages. The researchers thought that the ADA is the marker of cellular immunity and they have found the ADA serum levels of different diseases. The increased serum ADA activity is shown in the activation period of the autoimmune diseases which the cellular immunity was stimulated, such as typhoid fever, infectious mononucleosis, brucellosis, acute pneumonia, tuberculosis, sarkodioz, liver disease, acute leukemia, various malignancies and rheumatoid arthritis, systemic lupus erythematosus (SLE), Behcet's disease.[13-15] The adenosine deaminase enzyme deficiency is the single enzimopati showing an autosomal dominant inheritance between the defects of red blood cell enzyme deficiency. As a result of ADA enzyme deficiency the B and T lymphocytes lose their functional properties. Due to the large number of nucleoside kinase and recovery path enzymes in lymphocytes, the dATP concentration increases. With this increase the ribonucleotide reductase is inhibited and thus the formation of dNTPs is stopped. As a result, DNA synthesis can not be done. Because of the DNA synthesis deficiency, the lymphocytes are unable to fulfill their task and immune insufficiency occurs. As a result of these assessments, it has been found that the ADA activity is important for normal lymphocyte function.[13,15,16] In the study, the comparison of ADA levels between the serums of the patients with detected *E. coli* and the control group is aimed.

Material and method

The research has ethics committee report and was conducted between 2007-2008 at the University of Inonu. The study included only voluntary patients' samples. The intestinal parasites nativelugol were examined with the multiplication methods trichrome stain and cellophane tape method by taking perianal region material and only the patients with *E. coli* were consisted of these experiments. The patients who had different interference and any hormone medication, smokers and alcohol users were excluded from the ADA because of the thought that they would lead to differences in levels. In the control group, some volunteers were evaluated and they were non-smokers, not hormonal medication and alcohol users and they didn't have a parasitic infection. In the study, the parasite-positive patients were called back and after they had the necessary explanation for the work 5ml blood sample was taken from the wishing patients, then their serums were separated and stored at -20 until being worked on.

In this study the levels of ADA in the serums of 40 control groups and 35 patients who have *E. coli* are measured. In the serum ADA levels the methods developed by Ellis and Goldberg[17] were used. The ammonium ion, released from the adenosine with the effect of the adenosine deaminase enzyme, creates the green and blue indofenol complex as a result of Boertholet reaction. The intensity of occurred color has been increasing in proportion with the concentration of enzyme in the environment. This complex was read spectrophotometrically at a wavelength of 632 nm.

The data are expressed as mean ± standard deviation. The normality test, Shapiro-Wilk test was used. When comparing the averages of the patients and control groups, the independent sample T test was used. Statistically, it was considered that $p < 0.05$ was significant.

Results

In the study, Table 1 shows the descriptive statistics for the ADA activity. The mean age is 37.97±5.06, 31 (89%) male and 4 (11%) of them are women. The mean age of healthy 40 people 40.23±7.01 is 31 (77%) males and 9 (23%) of them are women. Statistically, any significant difference was detected between the mean age of the patients and control groups ($p = 0.17$).

Table 1. The adenosine deaminase activities of Entemoeba coli and the control group (U / L)

Variable	Groups	n	Statistics	P
Entamoeba coli (Mean ± SD)	Patient	35	29.06 ± 11.57	0.009
	Control	40	21.11 ± 14.08	

A significant difference was found between the control and *Entemoeba coli* (p=*0.009*). According to the controls, a significant increase was observed in the ADA activities of the patient group.

Discussion

The proliferating cells in tissues contain higher ADA activity. the ADA ratio in the cytoplasm is higher than the nucleus. But it has the highest concentrations rate in the lymphoid tissues.[18] Due to its physiological activity, it is an enzyme connected to the lymphocyte differentiation and proliferation.[13,15] The activity of the lymphocytes increase during the mitogenic and antigenic response of them. The ADA activity in T lymphocytes is slightly higher than in B lymphocytes.[19] The enzyme of adenosine deaminase accepted as the T-cell marker, increases in the plasma or in the body fluid for diseases in which the cell-mediated immunity stimulation occurs.[16]

The absence of ADA in the erythrocytes and lymphocytes leads to severe combined immune deficiency. Inhibition of this enzyme weakens the function and maturation of lymphocytes and the other immune cells, besides, when the monocytes and macrophages are infected with the intracellular parasites, they show increase in the activity of ADA. Because of the absence of ADA which is in all cells, the immune system damage occurs and recurrent chronic viral, fungal, protozoal, bacterial infections and lymphopenia are seen.[13]

In an increased ADA serum insufficiency, both the cellular and humoral immunity is in the condition of impaired.[13,15] The ADA activity increases with the autoimmune diseases which the cellular immunity was stimulated, such as typhoid fever, infectious mononucleosis, brucellosis, acute pneumonia, tuberculosis, sarkodioz, liver disease, acute leukemia, various malignancies and rheumatoid arthritis, systemic lupus erythematosus (SLE) and Behcet's disease.[14,15,20,21] In addition, it has been proposed that the ADA levels also increase in the patients who have primary immune deficiency (Leucocyte adhesion deficiency, hyper-IgM and Wiscott-Aldrich Syndrome, Chronic granulomatous disease).[22]

In the source Informations which have been reached before, it has not been encountered a study about the determination of the ADA level in the of *E. coli* infection.However, Tripathi and et al.[23] have found the ADA level was high in patients with visceral leishmaniasis. And also Hitoglou and et al.[24] have reported that the Ada level increased in mice infected with *Trichinella spiralis*. Again it is stated that ADA levels increase in malaria[25] and Gakis[26] acute toxoplasmosis. Also in the study, significant differences between the control group and *E. coli* were identified, according to the controls a remarkable increase has beenobserved at the level of the ADA (p = *0.009*). As the ADA activity is increasing when the immune system is activated, it is decreasing when being suppressed. It has been thought that the high detected serum ADA activity in the in serum of patients with *E. coli* is probably an indicator of the induced cellular immune response.

Conclusions

The findings seem to support that the parasite is pathojenic. In the studies which will be planned to determine whether the parasite is pathogenic or not, the determination of the ADA levels between the patients diagnosed with *E. coli,* before and after treatment, will be guiding. In addition, the determination of ADA levels can give knowledge about the patients' immune mechanisms and also it has been concluded that it can support the criteria for diagnosis and treatment of patients with positive *E. coli*.

Acknowledgements

The authors would like to thank Prof. Nilgün Daldal and Assist. Prof. Metin Atambay for their contributions to the study.

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The estimation of oncological value of selective neck dissection in cervicofacial region tumors

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Abstract

There has recently been one hundred years since George Crile demonstrated systematic cervical lymph nodes excision for treatment of patients with head and neck cancer. Due to morbidity of the radical surgical approach, the emphasis was made on surgically conservative approach, in cases where it does not have adverse effects on disease control and still offers preservation of functional and cosmetic status. Modified radical neck dissection (MRND) removes "*en block*" the same lymph nodes and vessels as radical dissection, but by preserving one or more non-lymphatic structures that are being entirely removed by radical dissection, it decreases postoperative morbidity. Selective neck dissections, which are being preferred by American head and neck surgeons, went even further. The research was performed at Institute for Otolaryngology and Maxillofacial Surgery of Clinical Center of Serbia in Belgrade. The study included 319 patients treated period, from January 1, 1997 to December 31, 2001, who have been followed up for at least 5 years after treatment. Having in mind that this was retrospective clinical study, i.e. longitudinal study, the choice of patients and variables was made based on patient records. Of 302 patients with determined category, the most were in T2 category (40.44%), while T1 tumors were four times less frequent. It has been observed that metastases recurrences have occurred in 57/319 (17.86%) subjects at various time intervals. By analyzing recurrent metastases according to N categories, it has been determined that the most of them were in N1 and N2 category. This was expected, as N1 category was the most represented in the entire group of patients with 137/319 (42.94%) cases, and the largest number of neck dissections – 137/291 (47.08%), primarily SND, were performed within this category. Patient five-year survival in our study has been analyzed according to N category, type of neck dissection, and recurrence of metastases (Figure 2). Over the first two years of follow-up, there has been larger survival tendency in MRND group compared to SND. The difference became comparable in the third year, and increased in favor of SND by the end of follow-up period. Although arithmetic mean value was almost the same, and median value was higher in patients with MRND, there is no significant difference in five-year survival among patients with N1 category (0.43; df=1; p>0.05).

Key words: selective neck dissection, metastases recurrence.

Introduction

There has recently been one hundred years since George Crile demonstrated systematic cervical lymph nodes excision for treatment of patients with head and neck carcinoma[1]. In 1906, George Crile has described surgical operation he called "radical neck dissection", based on his previous experience and a study of impressive group of 4.500 patients with head and neck carcinoma.

George Crile believed that it might be possible to obtain higher cure rate if lymph structures were removed radically, as a whole[1]. He argued that the key to the surgical method was excision of internal jugular vein and its adjacent tissues, knowing that the highest frequency of involvement with metastatic deposits is present in the region of jugular chain of lymph nodes.

In fifties and sixties of the past century, Pietrantoni L. and Bocca E. in Italy, Tapia G. and Rodrigez S. in Spain, Stell P.M. in Great Britain, Leroux-Robert J. and Guerrier Y. in France, as well as Denecke and Mündnich K. in Germany popularized surgery aimed at cervical metastases[2,3]. In the mid 20th century, Alonso J. from Uruguay, and

especially Osvaldo Suarez in Argentina were the most prominent protagonists of radical neck dissection development.

Over time, radical neck dissection has became almost standard procedure for patients who required surgical treatment of metastatic deposits combined with primary tumor removal[1,4]. In the meantime, everyone involved in treatment of patients with head and neck carcinoma began to understand that the radical neck dissection was adequate for treating large palpable lymph nodes, but that it was excessively aggressive in both patients with small palpable lymph nodes, and especially those without palpable lymph nodes or with high risk of metastases.

In the beginning of sixties of the past century, establishing concept of conservative, i.e. functional surgery of primary and metastatic cervical deposits was initiated[5]. The concept has all features of oncological radicalism, and relatively precisely established indications and contraindications. The functional neck dissection is based on using advantages of its specific anatomy, i.e. its fascial surfaces and compartments, in order to remove entire lymphatic system or its portions, with preservation of adjacent non-lymphatic structures. The key terms in this definition are "complete" and "portion", and they refer to lymphatic tissue. When American head and neck surgeons accepted this operation in the end of seventies, these two important terms vanished and the concept and spirit of functional dissection was seriously jeopardized.

According to many authors, cervical lymph nodes metastases lead to a decrease in survival of patients with squamous cell carcinoma of upper airway and upper digestive tract by approximately 50%. Due to morbidity of the radical surgical approach, the emphasis was put on surgically conservative approach, in cases where it does not have adverse effect on disease control, and still offers preservation of functional and cosmetic status.

Modified radical neck dissection (MRND) removes "*en block*" the same lymph nodes and vessels as radical dissection, but by preserving one or more non-lymphatic structures that are being radically removed by radical dissection it decreases postoperative morbidity. Selective neck dissections, which are being preferred by American head and neck surgeons, went even further. Operations include selective removal of individual groups of lymph nodes with risk of metastases and preservation of all non-lymphatic structures and remaining groups of lymph nodes in cases of node-negative neck. It use in cases of node-positive neck is being advocated as well. There are large controversies in this area, especially in patients with evident metastatic neck deposits.

Material and methods

The research was performed at Clinic for Otolaryngology and Maxillofacial Surgery of Clinical Center of Serbia in Belgrade. The study included 319 patients treated over a five year period, from January 1, 1997 to December 31, 2001, who have been followed up for at least 5 years after administered treatment. Having in mind that this was retrospective clinical study, i.e. longitudinal study, the choice of patients and variables was made based on patient records.

Two groups of patients have been established within the study. In first group were the patients with clinically node-negative neck (N0) in which primary tumor surgery and SND have been performed in one act. In the second group were the patients with clinically node-positive neck (N+) in which primary tumor surgery and SND have been performed in one act. Two control groups of patients have been established. In the first group were the patients with clinically node-negative neck (N0) in which primary tumor surgery and MRND have not been performed in one act. In the second group were the patients with clinically node-positive neck (N+) in which primary tumor surgery and one of MRND's have been performed in one act.

The decision on treatment modality was made by the Council for Malignant Diseases of Otolaryngological and Maxillofacial Region. For each subject, the following variables have been recorded: demographics (sex, age); clinical (localization of primary tumor, T category, N category, histopathological features, grade, course of disease, regional relapse, time of follow up, five year survival). Values have been recorded for quantitative variables, while categorical variables have been ranked in the appropriate established categories. The research results were processed using descriptive and inferential statistical methods. The special emphasis was made on methods for eva-

luating development of the event over time – survival (Kaplan-Meier test, LogRank test), as well as multivariate statistical methods (discrimination analysis, logistic regression analysis, and Cox proportional hazard regression method).

Results

The majority of patients included in this study were male - 209 (90.91%), while 29 (9.09%) were female. Mean age of all subjects was 56.36 years (x=56.36; sd=8.58; cv=15.22%). The development of cervical malignancy was followed and analyzed in primary tumors and metastatic deposits according to TNM clinical classification of malignant tumors, separately for each localization. Of 302 patients with determined category, the majority were in T2 category (40.44%), while T1 tumors were four times less frequent. This proportion relationship of T1 category compared to categories T2 and T3 suggests loss of time and difficulties in discovery of primary tumors at mentioned localizations. In 5.33% of patients, the location of primary tumor was not determined, even after complete diagnostic work-up (Table 1).

As a rule, the distribution of nodes by neck levels corresponded to node distribution by node groups, according to location of primary tumor. This was difficult to determine, due to non-observable boundaries of neck levels determined during surgical procedure, presence of node conglomerates, and of nodes merged with non-lymphatic structures. Subjects' nodes were predominately distributed within II, III and IV neck level, and according to primary localization, they corresponded to laryngeal carcinoma (Table 2). The groups of nodes at these levels are positioned along internal jugular vein and most commonly represent the site of metastases of cervicofacial carcinoma.

Among 319 patients (638 sides of neck), 347 sides have been subjected to surgery. Among those, 291 one-sided and 56 two-sided dissections have been performed. From total number of unilateral and bilateral surgeries, SND and MRND have been represented in approximately equal proportions. Among patients with III stage disease, most commonly performed procedure was SND accounting for more than half of total number of dissections performed at this stage of disease, while at IVA stage, the most commonly performed procedure was MRND (Table 3).

Table 1. Distribution of patients by primary tumor localization in relation to T caetgory

T Cat.	Localization of primary tumor										Total	
	Larynx		Pharynx		Oral cavity		Neck		Upt			
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Tx	0	0	0	0	0	0	0	0	17	100	17	5.33
T1	5	3.05	13	12.62	7	23.33	3	60	0	0	28	8.78
T2	58	35.37	50	48.54	19	63.33	2	40	0	0	129	40.44
T3	52	31.71	18	17.48	4	13.34	0	0	0	0	74	23.20
T4	49	29.88	22	21.36	0	0	0	0	0	0	71	22.26
Total	164	100	103	100	30	100	5	100	17	100	319	100

Table 2. The frequency of cervical metastases by neck levels compared to primary localization of tumor

level	Localization of primary tumor										Total	
	Larynx		Pharynx		Oral cavity		Neck		upt			
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
I	1	0.75	4	4.26	12	42.86	0	0	1	5.88	18	6.47
II	24	18.05	19	20.21	12	42.86	3	60	6	35.29	64	23.02
III	61	45.86	38	39.36	4	14.26	2	40	7	41.18	112	40.29
IV	41	30.83	31	32.98	0	0	0	0	3	17.65	75	26.98
V	5	3.76	3	3.19	0	0	0	0	0	0	8	2.88
VI	1	0.75	0	0	0	0	0	0	0	0	1	0.36
Total	133	100	95	100	28	100	5	100	17	100	278	100

Table 3. Distribution of neck dissections by clinical stage of disease

CSD	One-sided dissections								One-sided		Both-sided dissections		Total	
	MRND		RND		SND		PRND							
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
S 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S I	0	0	0	0	2	4.76	0	0	2	0.73	0	0	2	0.66
S II	11	9.24	0	0	11	26.19	0	0	22	8.00	0	0	22	7.28
S III	61	51.26	31	28.97	22	52.38	3	42.86	117	42.55	2	7.41	119	39.40
S IVA	47	39.50	51	47.67	7	16.67	3	42.86	108	39.27	25	92.59	133	44.04
s IVB	0	0	25	23.36	0	100	1	14.28	26	9.45	0	0	26	8.61
S IVC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	119	100	107	100	42	100	7	100	275	100	27	100	302	

Clinical evaluation of cervical lymph nodes is necessary, but unreliable in estimation of N0 neck status. Within the group of patients with clinically node-negative neck, approximately equal number of SND and MRND was performed. Each neck dissection sample has been histopathologically examined separately in order to identify occult metastases. Postoperative histopathological evaluation of neck dissection samples from patients with N0 necks has shown the presence of occult metastases in one fifth of patients. In our study, we found that the percentage of discovered occult metastases among MRND cases was somewhat higher compared to SND.

The occurrence of metastases recurrence has been analyzed in 319 patients who underwent one type of neck dissection in order to remove histopathologically verified and non-verified lymph nodes. It has been observed that recurrent metastases have occurred in 57/319 (17.86%) subjects at various time intervals. The frequency of recurrence was followed in relation to time of occurrence. The frequency of metastases recurrence observed by quarters was significantly different (χ^2=44.942; df=12; p<0.01). This highly significant difference is contributed by large differences in frequency in the second (m 4-6) and fourth (m 10-12) quarter and significantly high frequency in the first (m 0-3) and no occurrences in ninth (m 25-27) and eleventh (m 31-33) quarter. The frequency of metastases recurrence observed by yearly follow-up was significantly different (χ^2=52.825; df=3; p<0.01). This high level of significance of difference among frequencies is influenced by high frequency of metastasis recurrence in the first year of follow-up and low frequency of metastasis recurrence in the third and later years of follow-up. It has been noticed that the probability of metastasis recurrence in the first year of follow-up was above 80% and that it decreased every successive year, reaching above 70% during the last period. The follow-up of decrease in number of recurrences does not have such significance as follow-up of their occurrences during the first months after dissection. The decrease in number of recurrences after several months indirectly suggests the evolution of disease and patient survival with clinical presence of malignancy, that is relatively short and without five-year survival.

We continued to follow and analyze the frequency of recurrence in dissections compared to time of occurrence according to N categories. It has been found that the metastases recurrences in different time periods occurred among all N categories, regardless the category of node involvement.

N0 category showed one recurrence case within the initial three months after surgery. During the initial three months, recurrence cases occurred in all N categories. With the increase in N category value, the frequency of recurrence increased compared to total number in each N category. This largely confirms the significance of malignancy stage in evolution of regional involvement. The frequency of metastases recurrence in the first and second year of follow-up is not significantly different in any combination of N categories (p_1=0.583; p_2=0.792; p_3=0.833; p_4=0.075; p_5=0.446; p_6=0.266; p>0.05).

The frequency of N1 and N2 category is highly significantly higher, N0 i highly significantly

Table 4. Frequency of metastases recurrence by N category

Time in months	N categories				Total	
	N0	N1	N2	N3		
	Number	Number	Number	Number	Number	%
≤3	1	2	4	2	9	15.79
4-6	0	2	9	0	11	19.30
7-9	0	5	0	0	5	8.77
10-12	0	4	5	2	11	19.30
13-15	0	3	3	1	7	12.28
16-18	0	2	0	0	2	3.51
19-21	0	5	1	0	6	10.53
22-24	0	0	1	0	1	1.75
25-27	0	0	0	0	0	0
28-30	0	2	0	0	2	3.51
31-33	0	0	0	0	0	0
34-36	0	0	0	0	0	0
≥37	0	0	3	0	3	5.26
Total	1	25	26	5	57	100

lower, while N3 is significantly lower than expected (χ^2=36.122; df=1; p<0.01). In this study, recurrences occurred most frequently between six and 24 months in N1 category, and between nine and 24 months in N2 category (Table 4). In patients with N1 category, the arithmetic mean was higher compared to patients with N2 category. In patients with N2 category, metastases recurrence occurred with significantly higher frequency.

By analyzing metastases recurrence according to N category, it has been determined that the most of them were in N1 and N2 category. This was expected, as N1 category was the most frequent over the entire group of patients with 137/319 (42.94%) cases, and the largest number of neck dissections – 137/291 (47.08%), primarily SND, were performed within this category. This refers to N2 category as well, in which MRND's were performed in the first place. The proportions of subjects with metastases recurrence significantly differed by N category gradations (F_p=3.45; df_x=3; df_z=315; p=0.016; p<0.05). The proportion of metastases recurrence in N0 category was significantly smaller compared to the proportion of N1 category (d=-0.158; F_d=5.482; p=0.018; p<0.05) and highly significantly smaller compared to the proportion in N2 category (d=-0.221; F_d=10.026; p=0.002; p<0.01).

The frequencies of metastases recurrence are highly significantly different compared to both hypotheses that it is not expected. In general, their occurrence (χ^2=60.415; df=1; p<0.01), as well as compared to hypothesis that it is not expected in half subjects (χ^2=130.458; df=1; p<0.01). In the first analysis, the frequency of occurrence of metastases is highly significantly higher then expected, while it is highly significantly lower then expected in the second one.

The frequency of metastases recurrence by N categories was significantly different (χ^2=93.676; df=3; p<0.01). The frequency in N3 and N0 category was highly significantly lower, while in N1 and N2 categories it was highly significantly higher compared to the expected equal frequency.

The occurrence of metastases recurrence has been followed in SND group in which 122 unilateral dissections have been performed, and there has been 15/122 (12.30%) cases of recurrence registered. This was compared to recurrence in MRND group, where there were 31/119 (26.05%) of cases, or two times more. The proportions (0.123 - 0.260 - 0.119 - 0.250) of subjects with metastases recurrence differ significantly by proportion of unilateral dissection (F_p=3.104; df_x=3; df_z=287; p=0.026; p<0.05). Subgroup of patients with metastases recurrence who underwent MRND was significantly larger compared to the proportion of subjects with metastases recurrence who underwent SND (d=-0.137; F_d=7.792; p=0.005; p<0.01).

It has been observed that the probability of non-occurrence of metastases recurrence in SND

group was higher for each year of follow-up compared to MRND (Figure 1). At the end of follow-up period, the probability of metastases recurrence was twice as high in MRND compared to SND group. Subjects with N1 category who underwent SND and MRND have approximately similar arithmetical mean values. The level of significance was not reached for metastases recurrence in subjects with N1 category, when compared by type of neck dissection.

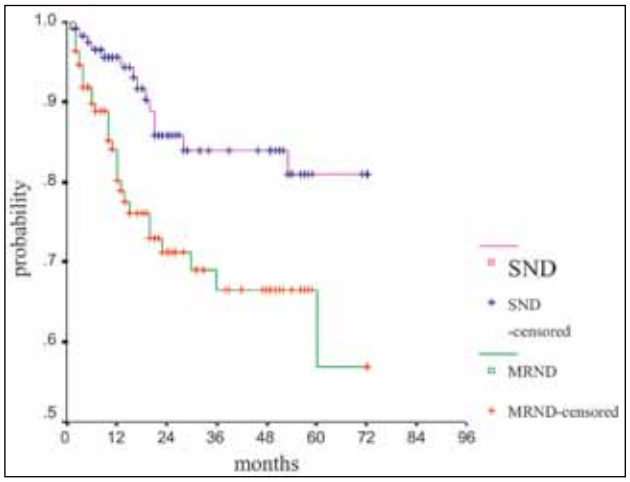

Figure 1. Comparison of probabilities for metastases recurrence by modality of dissection

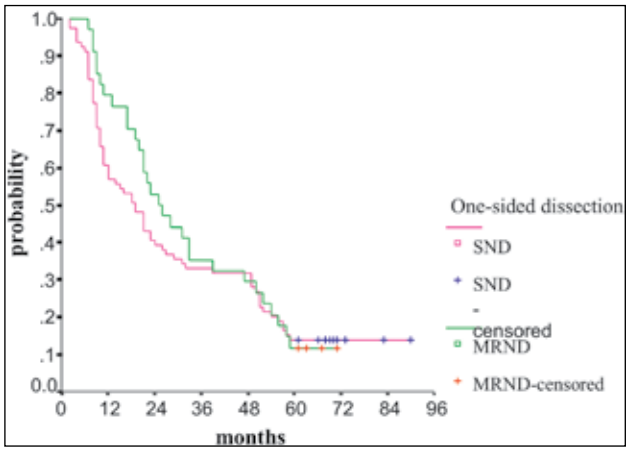

Figure 2. Five-year survival in patients with N1 category

Patient five-year survival in our study has been analyzed according to N category, type of neck dissection, and recurrence of metastases (Figure 2). During the first two years of follow-up, there has been larger survival tendency in MRND group compared to SND. The difference became comparable in the third year, and increased in favor of SND by the end of follow-up period. Although mean value was almost the same, and median value was higher in patients with MRND, there was no significant difference in five-year survival among patients with N1 category (0.43;df=1;p>0.05).

Discussion

Over the past years, there have been so many papers on neck dissections published that it is hard to believe there is anything new and interesting to add. At the same time, several controversial points of view have been presented regarding important questions, such as oncological safety, associated surgery and radiotherapy, preservation of non-lymphatic structures, approach to clinically node-negative neck, and surgical morbidity and survival of patients with MRND and SND[6,7].

In the first place, this refers to selective dissection that has several advantages over MRND. SND reduces morbidity and cosmetic defect, provides carotid preservation, and most importantly, confirms almost identical incidence of recurrence in the neck lymph nodes compared to MRND[8].

The principal question in the discussion on value of SND refers to control of metastatic disease in regional neck lymph nodes. Does selective dissection provides control of metastatic disease in cervical lymph nodes as efficiently as modified radical dissection?

The question whether localization of primary tumor should influence the choice of modality of neck dissection is being asked from the beginning of development of dissection surgery. It was during the time when radical dissection was preferred to MRND and SND and when it was considered to provide better therapeutic results. It is well known that cervicofacial carcinoma of certain locations has worse prognosis compared to other locations. Carcinoma of hypopharynx has the worst prognosis, but this prognosis will not be altered by aggressive surgical dissection techniques. In other words, in patients with N0 neck and pyriform sinus carcinoma, modified radical dissection will not provide much better results compared to selective dissection[7,9].

The approach that is accepted today when deciding on type of dissection is to separate primary tumor from secondary neck tumor. In patients with primary carcinoma of cevico-facial region,

neck should be treated according to its status. Primary tumor should not be used as a criterion for making choice about type of dissection. The decision on type of dissection that will be used should be based on characteristics of malignancy within neck nodes.

Contemporary approaches to clinically node-negative neck (N0) in cervicofacial carcinoma are much controversial from diagnostic and therapeutic aspect. Clinical estimate of node-negative neck (N0) is difficult and often leading to incorrect conclusion. It is being considered that the conclusion about N0 category of neck based on palpation is incorrect in 20% to even 50% of cases, much depreciating the estimate[10]. The advances in imaging techniques have reduced the rate of error of staging neck disease in cases when small nodes are not accessible for palpation[11]. One of the large dilemmas in oncological surgery of cervicofacial carcinoma is therapeutic approach to clinically node-negative neck (N0) with verified primary squamous cell carcinoma, due to the fact that occult metastases are often not detectable in N0 neck[12].

Over the recent years, other methods are being included in sample evaluation after dissection due to significance of occult metastases in relation to therapeutic alternatives and controversies with elective dissections of N0 necks. Apart from standard examinations, these methods include histochemical, immunological and molecular techniques aimed at detection of micrometastases[10]. Variable incidences of occult metastases have been reported, varying from 4-21%, depending on method being used. These results suggest that occult metastases are more common in primary tumors located in hypopharynx, supraglottis, oropharynx, and oral cavity. They refer to protocol developed by UICC that includes micrometastases N0 (mi)-metastases smaller that 2-3 mm, which would, according to authors, improve clarification of occult metastases.

The question that is being asked is how and whether clinical node-negative neck should be treated, or whether it should be subject to expectant approach. The other question is whether elective neck dissection should be method of choice as an individual treatment, or accompanied with postoperative radiotherapy. The answers to these questions are inconsistent and conflicting.

The value of SND must be evaluated through its ability to provide regional control of malignant disease. The principal question that should be answered when discussing value of SND is whether it provides control of metastatic disease in cervical nodes that is as efficient as in MRND, accompanied with decrease in surgical morbidity.

There are controversies regarding number of nodes that would influence choice of selective neck dissections. Doubts originate from time when non-radical dissections have been considered insufficiently oncologically radical. Many studies use number of lymph nodes in N+ neck in order to determine the prognosis. Conversely, other studies do not consider number of lymph nodes to be significant prognostic factor[7]. The choice of type of dissection should not be based on number of nodes, but on clinical and histopathological features of each discovered node. SND can be performed in patients with non-palpable nodes, or with small nodes that are palpable but not bigger that 3 cm, the size being only approximate factor. Surgeries on patients with multiple nodes are completely oncological safe while nodes meet the above mentioned criteria. In these cases, MRND will not be more certain compared to SND.

Recently, nine retrospective studies have been identified that have been thought to be suitable for analysis[13]. However, seven of these studies have been published before standardized classification of neck dissections that we accepted ourselves have been established; at the point of publication, modified dissections included both MRND and SND. These studies differed by indications for radiotherapy, by follow-up interval, etc. Therefore, any comparison among series have limited value. They retrospectively analyzed medical records of patients who underwent neck dissection at Oregon Health Sciences University from 1989 to 1998, as well as patients from Memorial Sloan-Kettering Cancer Center from 1995 to 1998, after standardization of neck dissections has been accepted and established[14]. Distribution of dissections in these analyses is comparable to our data, with observation that they had significantly higher number of SND.

Therefore, it is necessary to remove large number of nodes, from which any one may represent the location of metastatic deposit[15].

There is a consensus that SND is a method of choice for N1 category of nodes (without extracap-

sular spread), that were predominate among patients in our study. This indirectly confirms the appropriate approach in establishing indications for selective neck dissections performed on our subjects.

According to number of dissections compared to other types of dissections, it may be argued that in our settings, SND has been accepted as an adequate procedure for patients with N1 neck. This attitude is accepted by majority of cancer surgeons. SND is adequate procedure for patients with N0 and N1 category, in cases where there is no extracapsular expansion and involvement of non-lymphatic structures of neck[16,17].

The indications for SND have not yet been firmly established and universally accepted, due to lack of consensus regarding the approach to N2 nodes. It is entirely certain that the majority of surgeons who specialize in head and neck region have accepted selective neck dissection as an adequate procedure for approaching clinically positive N1 neck.

Some argue that SND is acceptable for patients with N2 nodes, in cases where there is no involvement of any non-lymphatic structures. Many of them believe that SND is indicated as an adequate procedure for N2 nodes as well[14]. Value of selective dissection still remains undefined for N2 category, and especially for N categories with extracapsular spread.

In our study, we observed 57/319 (11.86%) cases of metastases recurrence. It has been determined that with increase in N category, the frequency of occurrence of metastases recurrence raised, compared to total number for each N category, confirming the attitude about the significance of grade of malignancy for evolution of local disease. Sometimes, it is not possible to determine the statistical difference in rate of occurrence of recurrence in cervical lymph nodes in overall patient population, as well as among patients with N2 and N3 categories[17]. The presence of recurrence in N0 category was small in our series, while the largest number of recurrences occurred in N1 category (43.24%) and in N2 category (45.61%). This was expected, as N1 category was the most numerous in the entire series of patients, and the largest number of modified radical neck dissections has been performed in this category. This partially refers to N2 category.

Only few studies have compared metastases recurrence rates for SND and MRND. Metastases recurrence rates have been analyzed in nine retrospective studies that were considered to be appropriate for evaluation[13]. The mean combined recurrence rate after MRDV was found to be 13.6% (95% CI, range l2.0-15.2%), while mean combined recurrence rate after SDV was 6.9% (95% CI, range 5.4-8.4%). These studies were not homogenous and suitable for evaluation; they differed in indications for neck dissection, application of preoperative and postoperative radiotherapy, as well as follow-up interval. Therefore, comparison of outcomes between SND and MRND in these studies has limited value. We analyzed the proportion of metastases recurrence by type of neck dissection, as well as by occurrence in relation to the side of neck that was operated, in order to estimate the value of SND in control of regional nodal disease. This analysis is essential and has the largest importance for the estimation of SND value.

The occurrence of metastases recurrence has been followed in SND group in which 122 unilateral dissections have been performed, and there have been 15 cases of recurrence, or 12.30%. Among 119 MRND, there were 31 cases of recurrence (26.05%) which is twice more. From statistical perspective, SND is oncologically more efficient in control of node-negative and node-positive neck, as occurrence of recurrence is two times less frequent compared to MRND. The arithmetical mean value among patients with SND is higher compared to patients who underwent MRND. Occurrence of metastases recurrence is significantly more frequent among patients who underwent MRND. Apart from statistical evaluation, from clinical perspective, this relationship is explained by indications that have been established for SND. Selective dissection has been performed in lower N categories (N0 and N1 nodes), and rarely in N2 category, while radical dissections have been performed in N2 and N3 node categories. As a rule, the rates of control of regional malignant disease with SND are comparable to rates of control with MRND, with adherence to indications for MRND.

In our study, the estimate of patient survival with purpose of validation of SND was not in focus, as survival is more complex issue, as previously mentioned. In our study, as well as in numerous other studies, the validation of SND was based on recurrence of metastases that occur after surgery, as occurrence of metastatic recurrence is a confirmation of uncon-

trolled local/regional disease. Therefore, there are few studies that evaluate treatment results, but are more based on evaluation of recurrence of metastases. Many authors compared outcomes of SND and MRND and found three-year survival rate of 74% for SND compared to 63% for MRND group[18,19,20,21].

We went further in evaluation of SND value by analyzing five-year survival of patients by several parameters, and opposed to MRND. The probability of survival has been analyzed for all patients, with regards to type of surgery that was performed. It has been observed that the probability of survival for each one-year period was higher for SND, compared to MRND. The survival was significantly higher among patients who underwent SND. In patients with N0 neck and selective neck dissection, probability of five-year survival was 49%.

All these parameters favor SND over MRND, but the fact that window of indications for selective dissections is limited to N0 and N1 node category cannot be overlooked. From statistical perspective, SND is more efficient in control of node-negative and node-positive neck, as recurrence is two times less frequent compared to MRND. However, clinical judgment is required apart from statistical analysis, as it is known that SND is performed in lower N categories (N0 and N1), and rarely in N2 category, while MRND are predominately reserved for N2, and possibly N3 node categories.

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Validity and reliability of lung cancer quality of life Questionnaire from European Organization for Research and Treatment of Cancer (EORTC QLQ – LC13) in Iran

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Abstract

Introduction: Lung Cancer has a great impact on different aspects of quality of life of patients who are diagnosed with such cancer; therefore, conducting research on such patient's quality of life is essential. In this study we will examine the effects of lung cancer on quality of life of patients who are diagnosed with this cancer and propose a suitable questionnaire for the purpose of determining various scopes of quality of life of patients as well as the validity and reliability of such questionnaire.

Objective: The aim of this study is to investigation of validity and reliability of lung cancer quality of life from European Organization for Research and Treatment of Cancer (EORTC QLQ – LC13) in Iran.

Method: 75 lung cancer patients admitted to hospitals in Iran cancer Institute of Tehran University of medical science and Masih daneshvari hospital were chosen by nonrandom sampling. Demographic questionnaire EORTC QLQ – LC13 and EORTC QLQ – C30 were completed by the questioner. Descriptive data by frequency tables were analyzed and content validity we used translation for translating and internal consistencies were measured by the Cranach's α coefficient.

Results: total Cranach's α coefficient (The reliability or internal consistency) was 0.720. Spearman correlation coefficient of symptom and side effect subscale was 0.0601 not showed any overlap between questions of these subscales and the high measure of spearman rank correlation between symptom subscale and its questions was in the range of 0.357-0.754 and side effect subscale and its questions was 0.366-0.708, that indicated subscales of LC13 have significant correlation.

Conclusion: In general, the findings of this study indicated that the Iranian version of the EORTC QLQ-LC13 is a reliable and valid supplementary measure of the quality of life in lung cancer patients and can be used in clinical trials and studies of outcome research in oncology.

Key words: validity, reliability, lung cancer, quality of life, (EORTC QLQ LC13) questionnaire

Introduction

Lung cancer is one of the most frequent cancers among Iranian men and women patients[1]. There is a debate around the treatment of lung cancer as to which treatment modality should be administered and until what point in the evolution of the disease[2]. One of treatment approach for these patients is palliative treatment. Quality of life is a major consideration in this context and the adequate evaluation of the quality of life is therefore an essential endpoint[3].

Different purposes for assessing quality of life have led to the development and use of much different generic and disease-specific measures[4]. More than 50 instruments measuring quality of life (QOL) for patients suffering from lung cancer emerged from 1970 to 1995 [3]. The Lung Cancer Symptom Scale (LCSS), Functional Assessment of Cancer Therapy-Lung (FACT-L) and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core-30 (EORTC QLQ-C30) with Quality of Life Questionnaire Lung Cancer-13 (QLQ-LC13) have good reliability and validity[5].

The European Organization for Research and Treatment of Cancer (EORTC) is one of the largest clinical trial groups in Europe that has developed a core cancer-specific quality of life questionnaire (known as the EORTC QLQ-C30) and a number of supplementary questionnaire modules to evaluate the quality of life in cancer patients in general and specific cancer patient populations in particular. This modules are include: breast, head and neck, lung and others. The EORTC QLQ-C30[6] and the EORTC QLQ-BR23[4] are translated in to Persian and validated in Iranian population. We decided to translate in to Persian the lung cancer supplementary (QLQ-LC13) of EORTC QLQ-C30 and validate this instrument in Iranian patients population.

The QLQ-LC13 is contains 13 questions to measure one symptom scale (dyspnea) and nine single symptom items. A previous study demonstrated good internal consistency for the dyspnea scale and good clinical validity for most scores[7].

Under the guidance of the EORTC Quality of Life Group, and following their written guidelines[8], we have performed the translation and cross-cultural adaptation of the lung cancer module (QLQ-LC13). The forward/backward translation process was provided by the EORTC and the cross-cultural adaptation was performed by pilot-testing and by structured interviews. The purpose of this study was the validation of the Persian version of the QLQLC13, in order to allow Iranian investigators to use this tool both in clinical trials and in clinical practice.

Material and Method

75 lung cancer Patients were recruited from the hospitals of medical science university of Tehran. Patients were included if they had a pathologic diagnosis of lung cancer and were candidate for radiotherapy or chemotherapy. They were excluded if they have psychological or physical diseases. Patients completed written consent, the EORTC core questionnaire QLQ-C30 (version 2.0) and the lung cancer module QLQ-LC13 in an interview that was performed by one of the authors.

The QLQ-LC13 questionnaire consists of 13 items assessing lung cancer-associated symptoms (cough, haemoptysis, dyspnoea and site specific pain), treatment-related side effects (sore mouth, dysphagia, peripheral neuropathy and alopecia) and pain medication. All items employed a 1-week time frame and were scored on a 4-point categorical scale ranging from1 to 4. All responses are linearly transformed to a 0 to 100 scale, according to the scoring manual provided by the EORTC, with higher scores representing increasing symptom levels[9].

According to EORTC guidelines, two native speakers of the language of translation (Persian) who have a high level of fluency in English independently translated the questionnaire into the required language. The person responsible for coordinating the translation process compared the translations. This process resulted in a single provisional forward translation. In back translation phase two translators, native English speakers with a high level of fluency in language Persian independently translated the relevant sections from the provisional forward translation back into English without reference to the English original. The person coordinating the translation process compared the English translations with the original questionnaire. Then Pilot-testing consist of Administering the translated questionnaire was carried out on 10 patients belonging to the target population, and afterwards structured interviews with each patient individually was conducted.

Reports of the translation process and pilot-testing of EORTC QLQ-C30 were sent to Translation Coordinator, QL Unit, to be reviewed. Where the Translation Coordinator has concerns about the translations these may be discussed with the Chair of the Module Development Committee. The final Persian version of the EORTC QLQ-C30 and QLQ-LC13 was administered on 65 lung cancer patients.

Statistical analysis

A range of analyses has been performed. We have studied the frequencies of the demographic and clinical variables, and the Quality of Life scores. The reliability or internal consistency of The QLQ-LC13 questionnaire was measured by the Cronbach's a coefficient. Correlation analysis was performed to evaluate the construct validity.

Results

Patients (n= 65) averaged 53.09 years of age (SD = 15.33 years), included more men (73.3 %) than women (26.7 %), more married (90.7 %) than single (9.3 %), had the more number with

less than a high school education (74.6 %) and with a high school education or better (25.4), spoke mostly Persian (44 %) or Turkish (33 %), had tobacco use (56 %), had squamous cell carcinoma or Hodgkin's Disease and Non-Hodgkin's Lymphoma, and had chemotherapy (89.3 %) or surgery (10.7), degree of malignancy was more 2 (46.6%) than 3(25.9%), 1(15.5%) or 4(12.1).

The reliability, or internal consistency, of side effects and symptom scales is presented in Table 1. The Cronbach's a coefficient of scales was acceptable. Correlation analysis result is performed to show convergent validity. As table 2 shows two scales and their items are correlated. The result of discriminate validity is presented in table 3. The discriminate validity of side effects and symptom scales is acceptable.

Table 1. Reliability the EORTC QLQ-LC13

	Internal consistency (All patients, N = 65)	Number of items
qlq-lc13	0.720	12
Symptom scale	0.823	8
Side effects	0.701	4

Table 2. Convergent validity of the EORTC QLQ-LC13

Symptom scales	Symptom scales	Side effects
1	.385(**)	-.207
2	.357(**)	-.133
3	.530(**)	0.048
4	.754(**)	0.109
5	.635(**)	0.155
10	.654(**)	0.68
11	.405(**)	0.233(*)
12	.459(**)	0.004
Side effects		
6	-.202	.366(**)
7	0.269(*)	.563(**)
8	0.249(*)	.407(**)
9	-0.205	.708(**)

Table 3. Discriminate validity of the EORTC QLQ-LC13

	Symptom scales	Side effects
Symptom scales	1	0.061
Side effects	0.061	1

Discussion

Montazeri and his colleagues[9] for the first time have introduced a quality of life instrument to health professionals in Iran.

In this paper we present the results of a quality of life study carried out with a sample of Iranian lung cancer patients at different stages of disease. The demographic and clinical data of the sample are representative of lung cancer patients in our study. Despite the fact that this questionnaire originally was developed in Europe and our sample was culturally different population, The Iranian version of QLQ-LC13 was translated successfully and it was well accepted. The application was quick and easy to perform, confirming the usefulness of the scale.

The data were collected by interview and it took 10 min to perform each interview. There were not any incomplete questionnaires or missing information.

The internal consistency as assessed by Cronbach's a coefficient was found to be reliable. Correlation analysis result showed convergent validity and the discriminate validity of subscales was acceptable.

The reliability and validity of the Iranian version of QLQ-LC13 could be demonstrated in this study, but additional work is needed to assess the self-administered approach and t its psychometric properties.

The validation of this important instrument will allow Iranian investigators to perform research projects, and to assess the quality of life of patients with lung cancer in clinical practice.

Conclusion

This study showed that the QOL-lc13 is a valid and reliable instrument that may be of potential research use as a specific questionnaire for assessing the QOL of Iranian patients with lung cancer.

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Health care and rehabilitation in breast cancer patients

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Abstract

This article presents the preliminary experiences from an ongoing study aiming to develop multidisciplinary rehabilitation programme for women who undergo surgery, radiotherapy and systemic therapy for breast carcinoma.

The role of health care in oncological rehabilitation is to improve the outcomes, identifying the patients at risk, by implemantation of interventions with provision of monitoring and evaluation.

Principles of modern health care during oncological rehabilitation of patients are: directivity towards the users-patient, safety, efficacy, timely activities and efficiency.

Key words: health care, breast carcinoma, oncological rehabilitation

Introduction

Tendency to provide good quality treatment and care of patients and to achieve the most favorable outcome and a high quality of life is as the medicine itself. The first law regarding oncological patient's rehabilitation was passed by the USA Congress in 1965, which emphasized the necessity of rehabilitation in oncology due to risk of functional complications. However, organized efforts in establishing implementation and improvement of helath care and oncological rehabilitation system in our country are of a later date.

Oncological rehabilitation is a process of establishing of maximally possible physical, psychosocial, professional, economic, recreational and nutritive functions within the frameworks which are conditioned by the malignant disease and/or its therapy (1,2).

The basic idea of oncological rehabilitation is a complete or maximally possible independence in everyday life activities, which implies the highest possible quality of life. Health care in oncological rehabilitation is focused to prevention and/or reduction of the damage and handicap levels, regardless etiology or the anticipated survival (1,2).

Basic request, which is presented by implementation of four principles:

- Academic education- the changes in educational system of medical nurses and the foundation of academic studies of health care at the Faculty of Medicine in Novi Sad, enabled academic level of education for medical nurses in our country as well;
- Partnership-establishing of mutually useful relationships within the multidisciplinary team with respect to basic communication principles;
- Orientation towards the goals of health care- all processes, activities and interventiones are directed towards the improvement of functionaly capability of the patient;
- Holistic approach- trinity of the body, mind and the surroundings (3).

Health care principles in oncological patients

Health care in rehabilitation of oncological patients provides knowledge and skills which have a goal to prevent or support the restitution of a function and independence when oncological patients experience problems caused by any of the disorders related to the primary disease and/or therapy, which impact the locomotor system and/or incapability, which is the consequence of such disorder.

Principles of modern health care during oncological rehabilitation of patients are:

1. Directivity towards the users-patient: a health care plan is created in accordance with specific needs of oncological patient who participates in planning, analysis and implementation of her rehabilitation treatment;
2. Safety: all health care activities and interventions are planned and realized within the system, where the patient's safety is of primary importance, and

a potential danger to hurt the patient during the health care process is reduced to minimum;
3. Efficacy: defines the organized, individu-alized and goal oriented way to help the patient to solve or reduce functional problems, to maintain or improve health and prevent any possible new health problem in accordance with the remained potential;
4. Timely activities: an appropriate health care was rendered when the need for its rendering was recognized;
5. Efficiency: implies that the resources are used in a way and in the environment, which provide strategy selection with the aim of minimization and/or correction of patient's functional limitations (3-5).

Identification of risks for occurence of functional complications in breast carcinoma

As the breast carcinoma is not a single trauma, but a long-term multiple trauma with stressor, varying in its intensity and nature, health care, during the process of rehabilitation, is divided into several phases:

- From the moment of malignant breast neoplasm diagnosis;
- During the therapy: surgery, radiotherapy, systemic therapy (chemotherapy, immunotherapy and hormonotherapy);
- During the post-therapeutic period;
- During the patients' follow-up.

From the aspect of health care, as a consequence of complexity of medical therapy and its invasiveness, each of therapy modalities bears the risk for possible functional damages and/ or limitations, psychological, social and professional problems, which leads to reduced independence in performance of everyday life activities, i.e. impacts the quality of life of breast carcinoma patients (6-9).

Health care algorithm in breast carcinoma patients implemented at the Rehabilitation Department of the Oncology Institute of Vojvodina is based on applicability of five basic health process elements. From the moment of diagnosis, during the therapy and after the completion of the breast carcinoma therapy, the role of health care is to discover the risks, which may directly or indirectly influence the functional status of the patients (Table 1).

Recognized risks in various treatment phases of breast carcinoma patients are directed or indirected contributory factors for occurrence of functional complications. Prevention includes pretherapeutic patient's status evaluation, while therapeutic approach during rehabilitation has preventive, restitutive, supportive and palliative character by diagnostics and grading of possible risks, using a specifically designed scoring system and implementing appropriate health care interventions.

The role of health care in oncological rehabilitation is to improve the outcomes, identifying the patients at risk, by implementation of interventions with provision of monitoring and evaluation. The results of oncological rehabilitation activities in breast carcinoma are visible during the therapy, and the success of introduced health care measures is characterized by the preserved quality of life and working capability of the individual and reduction of health protection costs (10-14).

More than 2000 years ago, a Greek physician Herophilus wrote: *"Without health, art is worthless, force is weak, fortune useless and eloquence feeble"*.

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Table 1. Possible risks for occurence of functional complications in breast carcinoma in certain phases of the disease regarding health care - our experiences

DIAGNOSIS	1. Problem of facing the diagnosis. 2. Problem of available resources/potentials of a person: - physical: lung and heart function, muscle mass, mobility, etc. - psycho-social: inadequate adaptation, social interaction and communication disorder, avilable time, family relations, friends'support, financial conditions, etc. - person's characteristics: age, personal goals, self-perception, etc. 3. Existing functional damages/limitations-reduced independence in performance of everyday life activities, deficit in selfcare.
SURGERY	1. Type of surgical intervention and the spread of the malignant neoplasm. 2. Possible functional damages during the surgery and during the postoperative period: rigidity and fibrosis of the chest wall as a consequence of the disturbed lymphatic and venous drainage, infection, edema, etc. 3. Reduced mobility, comfort disorder. 4. Awareness of the planned intervention by the patient and the members of her family. 5. Expected end result. 6. Pain. 7. Problem of patient's and family's readiness for education.
CHEMOTHERAPY	1. High risk for skin integrity damage. 2. Inadequate drug administration. 3. Extravasation, inflitration, phlebitis during peripheral antineoplastic cannulation. 4. Accompanying side effects in antineoplastic administration: weakness, nausea, skin and mucous membrane changes, exhaustion, etc. 5. Sensor perception disorder (visual, tactile, kinesthetic). 6. Polyneuropathy, ataxia. 7. Insufficient knowledge on chemotherapy by the patient and her family members.
RADIOTHERAPY	1. Skin integrity damage (dry/wet desquamation). 2. Reduced effort tolerance. 3. High risk of late complications: brachial plexus damage, limited mobility, secondary lymphedema of the arm, etc.
POST-THERAPY PERIOD	1. Absence of regular physiatrist's examination. 2. Non-abidance of recommendations at home, non-cooperation of the patient and family. 3. Insufficient education at the primary and the secondary health protection levels. 4. Problem of rehabilitation organization at home. 5. Accompanying diseases. 6. Disease progression.

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Wilms tumor gene (WT1) protein expression in epithelial ovarian cancer

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Abstract

Epithelial ovarian cancer (EOC) is a heterogeneous disease. It has been shown that the expression of Wilms tumor gene (WT1) protein was different among the various EOC subtypes. The aims of this study were to determine the expression of WT1 protein in EOCs and to compare WT1 protein expression with EOC subtype, histological grade, and the International Federation of Gynecology and Obstetrics (FIGO) stage. This retrospective study was conducted in 102 patients with EOCs who underwent debulking surgery. The standard histological sections were used to assess pathologic parameters. Expression of WT1 protein in the tumor specimens was immunohistochemically analyzed by using monoclonal anti-WT1 antibody. The mean age of EOC patients was 61.2 ± 12.5 years (range 23-74 years). The most EOC patients had serous carcinomas (76,47%), histological grade 3 tumors (70,59%) and FIGO stage III disease (78,43%). Expression of WT1 protein was found in 80,39% of EOC specimens. The predominant expression pattern was homogenous, which was observed in 66,67% of WT1 positive EOC specimens. Expression of WT1 protein was significantly associated with serous subtype ($p<0.001$), higher histological grade ($p<0.001$) and advanced EOC stage ($p<0.001$). In conclusion, results of this study suggest that the expression of WT1 protein may be a marker of biological aggressiveness of EOCs.

Key words: Epithelial ovarian cancer, immunohistochemistry, Wilms tumor gene

Introduction

Epithelial ovarian cancer (EOC) behaves more aggressively than any other cancer involving the female genital tract and is the leading cause of death from gynecological malignancies in Western countries (1-4). The main prognostic factor for EOC patients is the International Federation of Gynecology and Obstetrics (FIGO) stage (3). Patients with FIGO stage I EOCs have a 5-year survival of more than 80%, while patients with FIGO stage IV EOCs have a 5-year survival of 18,6% (5). Unfortunately, approximately 70-75% of patients with EOCs have tumors spread beyond the pelvis (FIGO stage III or IV) at the time of diagnosis (2).

EOC is a heterogeneous disease. Currently, it is classified into eight distinct histological subtypes: serous, endometrioid, mucinous, clear cell, transitional cell, squamous cell, mixed epithelial and undifferentiated (2). It is a generally accepted opinion that the expression of a single or multiple oncogenes and subsequent activation of cell proliferation contribute to neoplastic transformation, tumorigenicity, and tumor progression. Such oncogenes and oncogene products may be of a clinical utility as prognostic factors or as therapeutic targets.

Wilms tumor gene (WT1) is mapped to chromosome 11p13 (6). WT1 was initially defined as a tumor suppressor gene, but today it is considered capable of performing oncogenic functions (7, 8). In the studies describing WT1 expression in ovarian cancer, there seem to be differences in expression patterns among different histological subtypes (9-13). A positive expression of WT1 has mainly been associated with ovarian serous carcinoma (9-16). Several studies have shown that WT1 plays an important role in the progression of the disease and prognosis of human malignancy (17-21). Recently, a study from Thailand examining the correlation between WT1 tumor tissue expression and survival has found WT1 to be indicative of an unfavorable prognosis in patients with advanced ovarian serous carcinoma (22).

Aims

The aims of this study were to determine the expression of WT1 protein in EOCs and to com-

pare WT1 protein expression with EOC subtype, histological grade, and FIGO stage.

Patients and methods

A retrospective study was conducted in 102 patients with EOCs who underwent debulking surgery at the Clinic of Gynecology and Obstetrics in Nis between January 2005 and December 2010.

Histopathological analysis of routinely processed tumor specimens stained with standard hematoxylin-eosin method and immunohistochemical analysis of WT1 were done at the Institute of Pathology, Faculty of Medicine, University of Nis. All the cases of EOCs were classified according to WHO criteria (2). Histological grade and stage of EOCs were determined according to FIGO criteria (5).

For WT1 protein detection, a monoclonal anti-WT1 antibody (clone 6F-H2, Dako) at a dilution of 1:100 and a standard avidin-biotin immunoperoxidase complexes detection system according to the manufacturer's protocol (Dako LSAB2R system-HRP) were used. The chromogen was 3,3'-diaminobenzidine (DAB), and the slides were lightly counterstained with Mayer hematoxylin (Merck, Germany).

Evaluation of WT1 protein expression was based on the proportion of cells in a given tumor tissue sample exhibiting distinct nuclear immunopositivity. The extent of immunohistochemical reactivity was scored as follows: 0 (<5% of the nuclei were stained), 1+ (5-25% of the nuclei were stained), 2+ (>25-50% of the nuclei were stained), 3+ (>50-75% of the nuclei were stained), and 4+ (>75% of the nuclei were stained). Two observers (BD and LJV) assessed WT1 staining pattern of each sample. Standardization of scoring was achieved by comparing the scores between observers, and any discrepancies were resolved by consensus.

The statistical analysis was performed by using Excel 2000 and Statcal. The results were presented as average, standard deviation, interval of variation (minimum-maximum) and index of structure (%). Chi-square test was used for the evaluation of significance of determined differences for attributive features. Differences were considered statistically significant at $p < 0,05$.

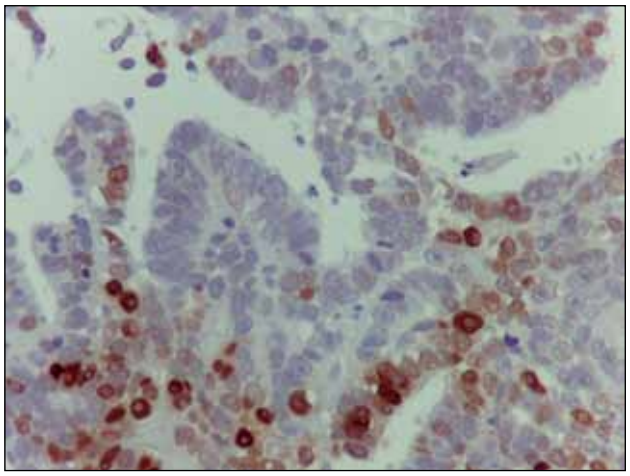
Results

The characteristics of study population are shown in Table 1. A total of 102 patients with EOCs were examined. The mean age of EOC patients was 61,2 ± 12,5 years (range 23-74 years). Histopathological analysis showed that the vast majority of patients (76,47%, 78/102) had ovarian serous carcinomas, while 23,53% (24/102) of patients had other EOC subtypes (6,86% clear cell, 5,88% endometrioid, 4,91% mucinous, 2,94% mixed and 2,94% undifferentiated). Also, the majority of EOC patients (70,59%, 72/102) had histological grade 3 tumors. Six (5,88%) cases were classified as histological grade 1 and 24 (23,53%) cases as histological grade 2 tumors. Advanced EOCs (FIGO stage III) were found in 78,43% (80/102) of patients. From a total of 102 patients with EOCs, 8 (7,84%) patients had FIGO stage I and 14 (13,73%) patients had FIGO stage II desase.

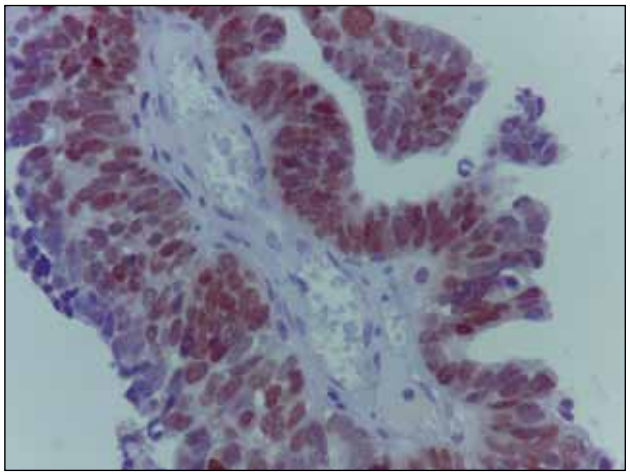
Immunohistochemical analysis showed positive nuclear expression of WT1 protein in 80,39% (82/102) of EOC specimens (Table 2). Heterogenous (1+ and 2+) expression of WT1 protein was found in 13,72% (14/102), and homogenous (3+ and 4+) in 66,67% (68/102) of EOC specimens (Figures 1a-d, Table 2).

Table 1. Characteristics of study population

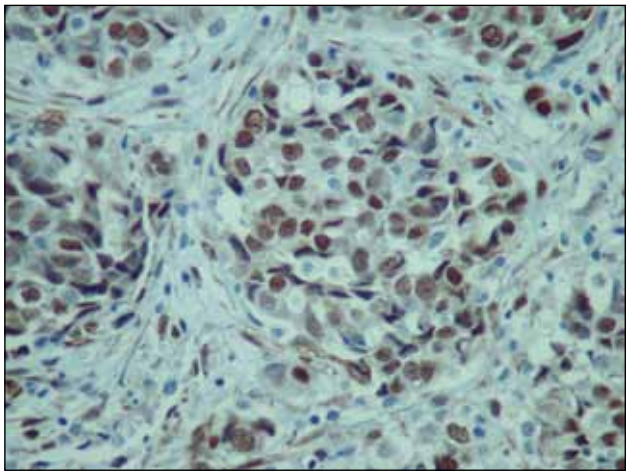
Characteristics	N (%)
Number of patients	102
Age	
Mean age (SD), years	61.2 (12.5)
Range, years	23-74
Tumor subtype	
Serous	78 (76.47)
Clear cell	7 (6.86)
Endometrioid	6 (5.88)
Mucinous	5 (4.91)
Mixed	3 (2.94)
Undifferentiated	3 (2.94)
Histological grade	
Grade 1	6 (5.88)
Grade 2	24 (23.53)
Grade 3	72 (70.59)
FIGO stage	
Stage I	8 (7.84)
Stage II	14 (13.73)
Stage III	80 (78.43)



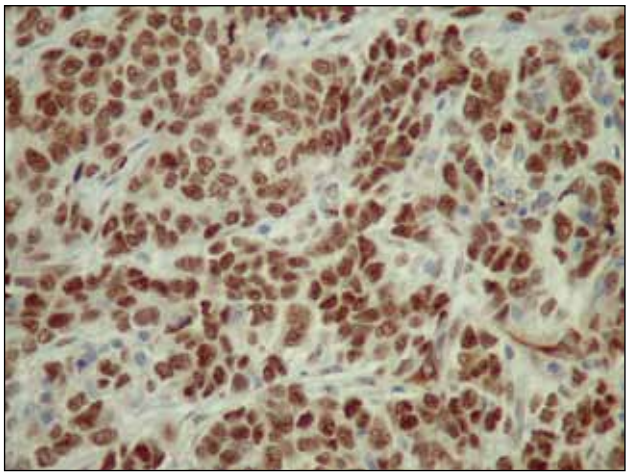
a)
1+



b)
2+



c)
3+



d)
4+

Figures 1a-c. WT1 expression in ovarian serous carcinomas showing heterogenous (a, 1+ and b, 2+) or homogenous (c, 3+ and d, 4+) nuclear immunoreactivity patterns (IH, x40)

Table 3 shows the results of comparisons of WT1 expression with tumor subtype, histological grade and FIGO stage in EOC patients. Positive WT1 protein immunoreactivity was determined in 94,87% of patients with ovarian serous carcinomas and was significantly more frequent in patients with ovarian serous carcinomas than in those with other EOC subtypes (clear cell, endometrioid, mucinous, mixed and undifferentiated) ($p<0,001$). WT1 positive EOC specimens had a higher histological grade of tumors then WT1 negative EOC specimens ($p<0,001$). In addition, there was increased frequency of WT1 expressing tumors in patients with advanced EOC stage (FIGO stage III) compared with patients with early EOC stages (FIGO stage I or II) ($p<0,001$).

Discussion

Nonspecific symptoms, frequent diagnosis of advanced disease, and the presence of drug-resistant histological subtypes limit the long-term cure rates and prognosis for EOC, thereby making this cancer the most lethal gynecologic malignancy.

In contrast to the most of other solid tumors, about 70-75% of EOC patients reveal in the advanced stages of disease (FIGO stage III or IV) (2) According to the data, approximately 50% of all ovarian carcinomas and 90% of advanced ova-

Table 2. Pattern of WT1 expression in EOCs

	Heterogenous (1+ and 2+)	Homogenous (3+ and 4+)	Total
	N (%)	N (%)	N (%)
WT1 negative	__	__	20 (19.61)
WT1 positive	14 (13.72)	68 (66.67)	82 (80.39)

Table 3. WT1 protein expression depending on tumor subtype, histological grade and FIGO stage

Parameter	Total N	WT1 expression		Chi-square *p*
		Negative N (%)	Positive N (%)	
Tumor subtype				
Serous	78	4 (5.13)	74 (94.87)	
Clear cell	7	5 (71.43)	2 (28.57)	
Endometrioid	6	5 (83.33)	1 (16.67)	<0.001
Mucinous	5	4 (80.00)	1 (20.00)	
Mixed	3	1 (33.33)	2 (66.67)	
Undifferentiated	3	1 (33.33)	2 (66.67)	
Histological grade				
Grade 1	6	5 (83.33)	1 (16.67)	
Grade 2	24	6 (25.00)	18 (75.00)	<0.001
Grade 3	72	9 (12.50)	63 (87.50)	
FIGO stage				
Stage I	8	7 (87.50)	1 (12.50)	
Stage II	14	4 (28.57)	10 (71.43)	<0.001
Stage III	80	13 (11.25)	71 (88.75)	
Total	102	20 (19.61)	82 (80.39)	

rian carcinomas (FIGO stage III or IV) are serous carcinomas (3, 23, 24).

In this study, the most EOC patients had serous carcinomas (76,47%), histological grade 3 tumors (70,59%) and FIGO stage III disease (78,43%).

Also, positive nuclear expression of WT1 protein was determined in 80,39% of EOC specimens. The predominant WT1 protein expression pattern was homogenous, occurring in 66,67% of WT1 positive tumor specimens, while 13,72% demonstrated heterogenous staining. Frequent expression of WT1 protein in epithelial ovarian tumors was reported in several studies (7, 11-15).

In current study, positive expression of WT1 protein was observed in 94,87% of ovarian serous carcinomas. Hwang et al. (14) reported positive WT1 expression in 93% of ovarian serous carcinomas, but not in mucinous, endometrioid and clear cell ovarian carcinomas. This led the authors to conclude that WT1 is a highly sensitive marker of ovarian serous carcinoma and to recommend the inclusion of WT1 in the immunohistochemical panel for analysis of unknown origin cancer in female patients. In contrast to Hwang et al. (14), we observed positive expression of WT1 protein in a small percentage of ovarian clear cell, endometrioid, mucinous, mixed and undifferetiated carcinomas, which is in agreement with several published studies (9, 10, 16, 25).

In this study, WT1 positive EOCs had a higher histological grade and FIGO stage compared to WT1 negative EOCs. Hylander et al. (9) also demonstrated positive correlation between WT1 expression and higher tumor grade and stage, and the lack of a significant correlation with overall survival. The impact of WT1 gene expression on the clinical outcome of ovarian cancer was not demonstrated by Danish "MALOVA" ovarian cancer study (25).

Netinatsunthorn et al. (22) divided WT1 positive ovarian serous adenocarcinomas into subgroups by the intensity of their immunostaining, and demonstrated that a high intensity of WT1 immunoreactivity had an independent prognostic value.

In one multivariate analysis, the prognostic value of the high-level WT1 immunoreactivity was also nearly significant (26). A high level of WT1 immunoreactivity in high-grade and advanced stage ovarian serous adenocarcinomas may have not only a diagnostic and prognostic value but also a potential for application of antigen-specific immunotherapy against this highly lethal malignancy.

Conclusion

In conclusion, positive expression of WT1 protein was significantly associated with serous subtype, higher histological grade and advanced EOC stage (FIGO stage III) Expression of WT1 protein may be a marker of biological aggressiveness of EOCs.

Acknowledgements

This work was supported by a Grant, No 175092, from the Ministry of Science and Technical Development of Serbia.

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True hyperkalaemia or pseudohyperkalaemia in a trauma patient after nephrectomy- differential diagnosis algorithm

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Abstract

Introduction. Clinician must always solve a problem of the first time ocurring hyperkalaemia in a patient. Detrimental effects off raised blood potassium on heart rhythm are well known and described. Hyperkalaemia is the most frequent electrolyte disorder which potentially causes severe arrhythmia and even cardiac arrest. Hyperkalaemia is defined as being mild when serum potassium is in range 5,0-5,9 mmol/l, moderate 6,0-6,4 mmol/l and severe >=6,5 mmol/l.

Case outline. We are presenting a case of a trauma patient with nephrectomy who developed raised serum potassium fourteen days after the surgery. During his hospitalization there were several factors that could predispose to hyperkalaemia such as possible renal failure, nephrotoxic medication and drugs that could elicit hyperkalaemia. At the end a benign state of pseudohyperkalaemia was diagnosed, which could sometimes be the reason for unnecessary treatment.

Conclusion. The purpose of this case investigation is short and concise review of literature concerning hyperkalaemia, its ethiology and influence on patient' s condition. At the end it offers an algorithm for a clinician to follow whenever raised serum potassium levels occur in a patient for the first time. Algorithm incorporates ethiology and pathogenesis of hyperkalaemia explaining the most important points in a succinct but sufficient manner.

Key words: hyperkalaemia, ethiology, differential diagnosis

Introduction

We present a case of a 35 year old man who underwent emergency nephrectomy after car accident and presented with raised potassium levels fourteen days later. We discuss possible explanations and present a differential diagnosis algorithm in case of raised serum potassium levels.

Case report

A 35-year old man was admitted to Emergency Department of a University hospital after a car crash accident. Initially, brief diagnostic procedures were undertaken in a regional hospital centre, and it was decided that the patient should be referred to a tertiary hospital centre due to serious injuries of the thorax and abdomen. On admission the patient, otherwise healthy, with no previous diseases, and taking no medication, was somnolent, hypotensive 90/50 mmHg, tachycardic 130/min and tachypnoic with respiratory rate of 30/min. Haemopneumothorax was diagnosed on the right side and a drainage of pleural cavity was performed. At admittance it was clear that the patient had abdominal injury due to abdomen tenderness and haemodynamic instability. After brief diagnostic procedures a rupture of right kidney was diagnozed and the patient underwent emergency explorative laparatomy and right nephrectomy. Intraoperative blood loss was about 4000 ml and aside cristalloids and colloids the patient was given 1600 ml of red blood cell concentrates. Postoperatively he was admitted to surgical intensive care unit (ICU) for a period of artificial ventilation and further fluid and blood products substitution. The patient stabilized hemodynamically, having a mean arterial pressure 70 mmHg, and hourly urine output between 0,75 and 1 ml/kg/h. It became clear that he needed high inspiratory oxygen concentrations (FiO_2=0,6) to maintain adequate arterial blood oxygenation although initial chest radiograms revealed only few opacities parahillary

and basally on the right. Lung contusion was suspected and confirmed by the third day when chest radiograms and CT of the thorax showed condensation opacities in the middle and lower parts of the lungs predominantly in the right hemithorax. Subsequently the patient met the criteria for acute respiratory distress syndrome (ARDS) by the day 4 and was accordingly treated. On the 6th day surgical tracheotomy was performed. During ICU hospitalization haemocultures identified Staphylococcus spp. and the patient received imipenem and teicoplanin for 14 days. The patient's condition gradually improved and he was weaned from the ventilator. It was noticed in the beginning of the third week (day 14) that his serum potassium levels raised above 5 mmol/l. The peak serum potassium levels were on the day 17-5,90 mmol/l. Since the patient underwent nephrectomy the first impression was that he is developing renal failure although his urine output was satisfactory (more than 1 ml/kg/h, he was even poliuric, having an hourly urine output 2 ml/kg/h). Further testing showed that blood urea nitrogen and creatinine remained in the reference ranges, so soon afterwards renal failure was excluded. It was assumed that raised serum potassium levels were of "in vitro" origin and correlating to concomitant thrombocytosis (table 1). On the day 20 the patient was transferred to Urology department in a satisfactory condition. On the day 27, the patient checked out of the hospital in satisfactory condition.

Discussion

The incidence of high blood potassium levels in unselected hospital patients ranges between 1,1 and 10 % [1]. Perkins and colleagues in their observational study showed that as much as 29 % of non-crush trauma patients develop hyperkalaemia in the first 12 hours after admission. They also showed that hyperkalaemia is an independent risk factor for higher mortality [2]. In crush injuries such as occur during earthquake, reported incidence of hyperkalaemia can be as high as 42 % [3]. It seems that hyperkalaemia is the most frequent electrolyte disorder which potentially causes severe arrhythmia and even cardiac arrest [4]. The highest potassium measurement in our patient was 5,9 mmol/l which can be defined as mild hyperkalaemia (mild hyperkalaemia 5,0-5,9 mmol/l, moderate 6,0-6,4 mmol/l and severe >=6,5 mmol/l) [4]. Raised plasma potassium remains always a concerns to a physician due

Table 1. Platelate count and potassium levels corresponding to possible nehrotoxic stimuli

Day of hospitaliazation	Platelate count [x 10^9 /l]	K^+ [mmol/l]	Nephrotoxic stimuli
1.	76	4,70	Nephrectomy, hypovolaemia
2.	89	4,90	
3.	37	3,78	
4.	63	3,67	
5.	102	3,63	*teicoplanin therapy*
6.	126	3,73	
7.	211	3,73	
8.	319	4,28	
9.	314	4,19	
10.	370	4,18	
11.	516	4,41	
12.	-	-	
13.	591	4,36	
14.	**661**	**5,15**	
15.	**710**	**5,51**	
16.	**704**	**5,31**	
17.	**680**	**5,90**	
18.	**-**	**5,59**	
19.	-	-	
20.	-	-	

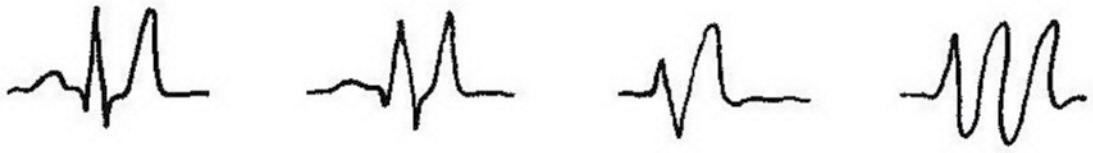
to detrimental effects of hyperkalaemia on heart muscle excitability [4,5]. EKG changes involving hyperkalaemia are shown in the table 2. It is important to stress that relationship between the degree of hyperkalaemia and EKG changes is variable; in rare cases of severe hyperkalaemia, EKG can be normal or near normal [6]. Montague and colleagues showed that EKG is insensitive for diagnosing hyperkalaemia and that the probability of specific EKG changes increases as the potassium increases. At lower concentrations of serum potassium, specific EKG changes are rare and the incidence of complications is low [1]. On the other hand, Weiner and Wingo stated that progression from benign to lethal arrhythmias is unpredictable and the presence of any EKG findings of hyperkalaemia should be considered a medical emergency [7].

Our patient was at risk of acute renal failure (ARF). Due to massive haemorrhage and a period of transport from the regional centre the patient was hypovolemic and hypotensive. ARF is a sudden sustained decline in glomerular filtration rate usually associated with uraemia and a fall in urine output [8]. In 1996. Madrid study group found an incidence of ARF to be 209 patients per million population and that one in 267 admitted patients had renal function deterioriation [9]. ARF was considered when a sudden rise in serum creatinine concentration (S_{cr}) to more than 177 μmol/liter was found in patients with previously normal renal function, or when the sudden rise (50% or more) was observed in patients with previous mild-to-moderate chronic renal failure (S_{cr}<264 μmol/liter). In the same study mortality attributable to ARF was 26,7 % [9]. Apart from ARF, the patient can be in a chronic renal failure which can decompensate after an event such as hypovolemic shock and nephrectomy: acutisation of chronic renal failure. When having a patient that underwent nephrectomy one should always take into account that remaining kidney could be insufficient due to a chronic preexisting condition. Nephrotoxic drugs can lead to acute renal failure especially in the setting of hypovolaemia. Our patient was receiving teicoplanin from 5th to 18th day due to a staphylococcal infection; at that time he was not hypovolemic. Low molecular heparin (LMWH), which our patient received, can lead to hyperkalaemia. Varughese and coworkers reported a case of a patient with type 2 diabetes who developed hyperkalaemia after three days of LMWH therapy [10]. Diabetes patients seem to be susceptible to heparine-induced hyperkalaemia since many of them use other drugs that can raise serum potassium (such as ACE inhibitors and potassium sparing diuretics) [10]. The list of drugs that can cause hyperkalaemia is vast; the mechanisms of hyperkalaemia induction are various [11,12]. Lastly, we noticed that thrombocytosis was a concomitant finding in our patient. Thrombocythosis on the seventeenth day was 680 x 10^9/l and correlating potassium levels were 5,90 mmol/l. Repeated testing which used plasma instead of serum showed that potassium was within reference values and was 4,1 mmol/l. In fact, thrombocytosis can be associated with pseudohyperkalaemia which is defined as a difference between serum and plasma potassium higher than 0,4 mmol/l [4,13]. Interestingly, pseudohyperkalaemia can lead to unnecessary therapeutical interventions. There have been reports of unnecessery glucose and insulin administration and even dyalisis in setting of spurious hyperkalaemia [14-16]. In our patient, before the nature of the elevated potassium blood levels were explained, he was given normal saline, in order not to raise serum potassium levels. Finally we are proposing an algorithm that deals with de novo hyperkalaemia laboratory finding in a patient. Following this algorithm a clinician will be able to distinguish whether a state of true hyperkalaemia exists and consider the possible etiology and act immediately if indicated.

The first step in **EUMaP** algorithm for hyperkalaemia (**E**KG signs of hyperkalaemia, **U**nderlying conditions that cause hyperkalaemia, **M**edications that induce hyperkalaemia and states that can cause **P**seudohyperkalaemia) is to determine if there are any **E**KG signs of hyperkalaemia since these arrhythmias can be life threatening. The next step is answering a question are there any possible **U**nderlying conditions that can cause hyperkalaemia. It is important to stress, once again, that potassium is the most abundant intracellular kation. Potassium intake can be per os or intravenous; this kation is mainly excreted by kidneys. **M**edication-induced hyperkalaemia (MIH) is a type of iatrogenic hyperkalaemia. Circumstances in which MIH occurs usually include administration of a medication in setting of impaired potassium excretion or concomitant administration of more than one hyperkalaemia-inducing drugs. **P**seudohyperkalaemia is, finally, considered.

Table 2. EUMaP algorithm for first time laboratory high potassium finding

I EKG signs of hyperkalaemia: **Exclude high potassium dysrhythmia**-is the patient at risk for cardiac complications?[4,5,11]

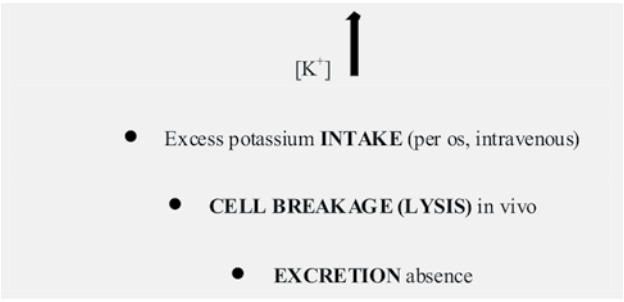


- Peaked narrow T waves, shortened QT interval
- Widening of the QRS complex, decreased amplitude
- Ocassionally ST-segment elevation in V_1 and V_2 can be seen mimicking acute myocardial infarction (due to nonhomogenous depolarization in different portions of the myocardium)
- PR prolongation, loss of P wave, second or third degree A-V block
- Sine-wave pattern (with widened QRS complex merging into T wave), ventricular fibrillation
- Bradycardia

Alfonzo and coworkers: high risk of cardiac arrest when there is **widened QRS, sine wave pattern, bradycardia or ventricular tachycardia.*[4]

II Is there an **UNDERLYING CONDITION** that can be the cause of hyperkalaemia [3,4,7-9,11,19]

A. Renal failure-is there a possibility that the patient is experiencing some kind of renal function deterioriation? (blood-urea nitrogen, creatinine, urine output less than 0,5 ml/kg/min in the absence of dehydration)



- **chronic failure**-usually there is history of chronic failure, the problem could be first time presentation
- **acute failure**-hypovolaemia and severe dehydration, nephrotoxic drugs (aminoglycosides, vancomycin, radiocontrast solutions), postrenal obstruction (calculi, prostate hypertrophy, urine bladder infiltrative tumor, gynecological malignancy). Diganosis of acute renal failure: sudden creatinine rise to more than 177 μmol/l.[9]

*Hypovolaemia and dehydration should be corrected if nephrotoxic medication are to be administered to the patient.

- acutisation of chronic renal failure (grades I, II or III) in setting of nephrotoxic stimuli-sudden rise of creatinine (50% or more) observed in patients with previous mild-to-moderate chronic renal failure [9]
- non oliguric renal failure

B. Metabolic disorder

- Acidosis-K+ shift-potassium exits the cells as H+ kations become abundant in extracellular space and they tend to enter the cells in order to compensate and maintain pH balance (K+/H+ contratransport)
- Adrenal insufficiency

C. Excess potassium intake

- Transfusion of blood
- Excess intravenous administration during impaired excretion
- Oral intake (sodium-restricted diet which is inherently high in potassium, fruit juices and beverages can be high in potassium) [17]

D. Cell lysis - intense tissue destruction

- Excessive burns, high voltage electrical injuries
- Crush syndrome (rhabdomyolysis, hypovolaemia, acidosis-several mechanisms apart from cell lysis account for hyperkalaemia development)
- Haemolytic toxins
- Rhabdomyolysis-traumatic (e.g. crush syndrome) or drug-induced (statins, fibrates, isoniazid, valproic acid, tricyclic antidepressants, pentamidine, amphetamines, cocaine and many other)[19]. Myoglobin clogs glomerules and can cause acute renal insufficiency which aggravates hyperkalaemia

III Does the patient take or is given any MEDICATION that can cause hyperkalaemia?

The mechanisms of potassium elevation are various![10-12,18,19]

- ACE inhibitors and angiotensin receptor blockers-these medication cause hypoaldosteronism; the risk of hyperkalaemia increases with dose escalation, use of concurrent hyperkalaemia-inducing medications and use in patient with diabetes, chronic kidney disease and chronic heart failure.
- Heparine and low molecular weight heparin-inhibit aldosterone synthesis
- Succinylcholine (muscle relaxant used for crush induction, increased potassium release from the cells. This effect is pronounced in renal failure, burns and different neurological diseases which affect neuromuscular junction)
- β-blockers-reduce renin secretion thus causing hypoaldosteronism, other mechanism is by decreasing intracellular potassium shift
- Trimethoprim-impairs potassium secretion
- Potassium-sparing diuretics -spironolactone (aldosteron antagonist- spironolactone dose should never exceed 50 mg daily, special intention should be given if patient' s creatinine level is higher than 220 μmol/l as these patients are at risk of hyperkalaemia occurence), amiloride and triamterene inhibit potassium secretion
- Potassium supplements in excess and during decreased urine output
- Medications in form of potassium salts-benzylpenicillin (when given in high dose it carries a substantial potassium load)
- Nonsteroidal anti-inflammatory drugs-reduce renin secretion and decrease glomerular filtration rate by constriction of afferent arteriole.
- Digoxin overdose-increased potassium release from the cells
- Pentamidine, cyclosporin A, tacrolimus-inhibition of potassium secretion

*The patient is at risk for medication-induced hyperkalaemia (MIH) if he is given a drug that can raise serum potassium in setting of impaired potassium excretion or excessive intake. Risk of MIH exists, also, when two or more hyperkaliaemia inducing drugs are administrated to the patient concomitantly.

IV Exclude PSEUDOHYPERKALAEMIA [13-16]

Conditions associated to pseudohyperkalaemia ("in vitro" hyperkalaemia, spurious hyperkalaemia) which is defined as difference in serum and plasma potassium concentrations of more than 0,4 mmol/l.

- In vitro haemolysis, inadequate sampling and long sample storage, use of tourniquets, fist clenching during phlebotomy, mechanical trauma during shaking or centrifugation of the blood sample
- Increased number of blood cells: thrombocytosis, leukocytosis (acute leukemia, chronic myeloid leukemia, chronic lymphocytic leukemia, polycythemia rubra vera, essential thrombocytosis, reactive thrombocytosis in chronic infection or postsplenectomy)

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Characteristics of fundamental laryngeal voice (f0) in developmental verbal apraxia

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Abstract

Objective. Developmental verbal apraxia (DVA), or developmental apraxia of speech is a motor speech disorder of motor programming and planning. Children with DVA have problems with saying sounds, syllables, and words. The aim of the study was to determine the characteristics fundamental of *laryngeal voice* in *developmental verbal apraxia*. Two parameters are observed: *height and tension of voice*. The research was conducted at the *Institute for Experimental Phonetics and Speech Pathology* and in the *Institute of psychophysiological disorders and speech* in Belgrade.

Methods. The sample consisted of 45 children ages 4-5 years. The first group (N=15) were children with diagnosed developmental verbal apraxia, the second group (N=15) children with diagnosed developmental dysphasia, and the third group (N=15) included children with diagnosed developmental phonological disorders. Groups were equalized in relation to age. The study was carried out individually.

Results. Qualitative analysis of the results showed that: for 20% of group with phonological disorders it is present low voice in the normal tension, and in 80% of children it is present normal height in a normal voice tension. In group with dysphasia 13.4% of children have a low voice in the normal tension, 66.6% of children have normal height and normal tension, and 20% of children have raised voice in a normal tension. In the group of children with developmental verbal apraxia, 26.6% of children have a low voice in the hypotension of the first degree, 6.6% of children have a low voice in normal tension, three children have low voice in hypertension of the second degree, 20% of children have elevated voice in hypotension of the second degree, 6.6% have increased voice in a normal tension, and 20% have elevated voice in the first degree of hypertension.

Conclusion. Results show that disturbances in height and tension of *fundamental laryngeal voice* are present in children with *developmental verbal apraxia* in a greater degree than in children with *developmental dysphasia and developmental phonological disorders*.

Key words: verbal apraxia, laryngeal voice, developmental dysphasia, developmental phonological disorders.

Introduction

Childhood apraxia of speech (CAS), or developmental verbal apraxia (DVA), or developmental apraxia of speech is a motor speech disorder caused by damage on areas of the brain that control the voice. It is caused by stroke, injuries during labour, and genetic disorders. *Apraxia of speech* is a disorder of motor programming and planning. Children with CAS have problems with saying sounds, syllables, and words. Reason for this is not muscle weakness or paralysis. The brain has problems in planning to move the body parts (e.g., lips, jaw, tongue) which are needed for speech. The child knows what he/she wants to say, but his/her brain has difficulty in coordination of the muscle movements which are necessary for saying those words. The severity of the voice fluency problem varies with the type of the brain damage. Patients have troubles with sequencing sounds and words. This is frustrating, as the patient knows what he/she wants to say, but is unable to coordinate his/her muscles to say the correct words. Replacement of words (house instead of hair), or non-words (her can) may come out instead. (http://www.livestrong.com/article/254867-about-voice-fluency-disorders/# ixzz1X8R5Izdr)

Apraxia of speech is a neurological condition affecting the development of a child‘s speech. *Apraxia* is a neurological impairment in which are involved planning, executing, and motor sequenc-

ing movements. *The National Institute of Health* (USA) defines apraxia as a disorder of the nervous system. Apraxia is perhaps the most misunderstood of all the speech disorders. *Verbal apraxia* is a neurological motor speech impairment that involves a breakdown in the transmission of messages from the brain to the muscles in the jaw, cheeks, lips, tongue and palate that facilitate speech. There is no obvious weakness in these muscles, and a child may as well be able to move them quite normaly when not trying to speak. *Apraxic children*, who are usually seen as "*just late talkers*" when young, are able to comprehend language at appropriate age level. However, they have difficulty in expressing themselves while speakig. With apraxia, a child knows what he/wants to say but there is a block in a pathway which is obstructing the signal from the brain to the mouth. For any child with a speech disorder, but especially with apraxia, the earlier therapy begins, results are better for the child and his/her social-emotional development. *Verbal apraxia* (VA) is a *motor speech disorder* that interferes with an individuals' ability to correctly pronounce sounds, syllables, and words. It is a neurologically-based *motor planning disorder* of unknown cause. *Verbal apraxia* may occur as part of many neurological conditions, or may occur separately. Although the specific causes are unknown, possibilities include: direct result of neurological damage, as a complex neurobehavioral disorder (genetic, metabolic) and *neurological speech sound disorder* (speech delay, verbal apraxia).

Since the human voice is the only one that can simultaneously produce a word and tone, it is of particular importance in communication because it gives us a lot of information's about a particular person, or of person's sex, age, health, temperament, thoughts, feelings, moods, etc. The *fundamental frequency / fundamental laryngeal voice* (Fo) is an essential component of spoken voice, or the frequency with which the vocal cords vibrate. *Pitch* is a perceptual phenomenon, and depends on the fundamental frequency, which is a physical parameter. The fundamental frequency (Fo) is the number of vibrations that vocal cords make in one second, expressed in hertz (Hz) and is determined with the activity of internal laryngeal muscles, with subglotic pressure and tension, weight and length of the vocal cords, which is partly a consequence of cricoid, thyroid and arytenoid cartilages. Value of Fo is influenced with age, sex, physical constitution, social environment, emotional, intellectual status, laryngeal pathology, mental disorders, hearing impairment, neurological and endocrine disorders and general health. The voice is not monotonous and is not constant, depends on the emotions, pace, intonation and volume, which means that affectivity follows our vocal and general behavior.

The main characteristics of voice are height, intensity and timbre. Subjectively, voice is estimated as: *high, low, tight, rough, hoarse, beep*, etc. This subjectivity can be verified by objective testing methods.

Voice changes are manifested in three basic features: the tone, intensity and timbre. In addition to basic, there are two more features of voice, amount of noise in the voice and the way to start a voice (of attacks).

Material side of each voice, according to Belic, represent the volume of voice and it's tone: pitch or tone of voice, strength or tone of voice, timbre or tone, loudness and duration of voice or tones [2]. The main task of the vocal cords is to produce sound waves that interlocutor can hear. Vocal cords make clear high tones, and their height and intensity depend on the shape of the larynx, vocal cord length, tension, and speed of their flickering. All these features are changeable, and differ from person to person.

The sound obtained by relaxation vibration of the vocal cords, in whose rhythm the air current modulates, is called primary laryngeal voice. That sound is too weak and not audible. Final strength, audibility, volume and timbre are obtained by passing through the vocal tract, and resonant cavity when the voice occurs [2].

The main laryngeal voice occurs by vibration of vocal cords in the horizontal plane (by which is expiratory rhythmically interrupted). It is amplified with resonant processes and articulation (in resonant and articulation cavities), and modeled in the speech sounds. The phenomenon of resonance in the physical sense represents the increase of intensity of vibration when the frequency of external force that causes vibration, coincides with vibration frequency of their own systems [3]

In the acoustic image appear upper tones, i.e. harmonics, in addition to the basic tone. In humans, as a resonant cavity, are operating mainly oral and

nasal cavities, in the some parts pharynx and larynx, and in the wider sense, the whole head and chest. With movements of articulation organs (tongue, palate, lips, cheeks, laryngeal and pharyngeal anal sphincters), shape and size of the resonant space are changing, by which to some extent they enhance or suppress the basic laryngeal voice, thus giving the specificity of acoustic impression and image of generated voice/voices. The absence or occurrence of pathological resonant frequencies substantially changes the structure of speech, and by auditory perception are revealed advances in timbre, sonority and nasality of voice [4]

Insonation of the *fundamental laryngeal voice* in the higher harmonic tones, with vowels and consonants modulation, is performed by supraglotic structures of the larynx, pharynx, oral and nasal cavity; structures that represent the voice resonator [5].

Pitch is a perceptual phenomenon, and depends on the fundamental frequency, which is a physical parameter. The fundamental frequency (F0) is the number of vibrations that the vocal cords make in one second [6].

Modulation with vocal cord creates the sound which has features of the harmonious sound, by which are produced all vowels in the speech, and it has low intensity and is almost inaudible. Basic laryngeal voice when going through the resonant cavity increases and creates the harmonic tones that mark the voice [7].

Pitch depends on the speed of vibration of the vocal cords, or the fundamental frequency. Faster vibration creates a higher tone of voice, or a higher frequency. A speed of the vocal vibration depends on the thickness, length and tension of the vocal cords and air pressure that passes between the vocal cords. It is determined by the activity of internal laryngeal muscles, subglotic pressure and tension, weight and length of the vocal cords, which is also partly a consequence of the position of cricoids, thyroid arytenoid and cartilage [8]. One of the fundamental meanings of phonation is contained in this thought: "phonics is in the human development process, the result of an ingenious use of breathing mechanism for meaningful communication" [9].

Phonation or voice performance in the pharynx is part of the complex voice features, but at the same time its important element. The activity of the larynx is not equal in the performance of all voices. All vowels and consonants are created by vibration of adduced vocal cords, thus producing a basic laryngeal tone, while in unvoiced consonants role of the larynx is minimal, because vocal cords are and are not vibrating [10].

Generally when speaking about the phonation, it is meant of vocalization - the vocal performance in the pharynx. Phonics is defined as expiratory modified by laryngeal vibration and it occurs, according to recent findings in the following way: after prefonatory, willingly inspiration started, followed by prefonatory expiratory, vocal cords take the paramedial position which is triggered with nerve impulses which come in the laryngeal muscles with the upper and lower laryngeal nerve. With the same nerves are coming impulses, and with their action is changed the weight, length and tension of the vocal cord.

Partial obstruction of expiratory air currents is caused with *Bernoulli effect*: constant volume flow on the place where sudden narrowing appeared is achieved by increasing velocity, thus reducing pressure at the narrowing. Because of that pressure drops in the subglotic region, and vocal cords are inserted to the center line followed by complete obstruction of air flow. With this is increased the subglotic pressure which suddenly linger the vocal cords to paramedial position [11].

Such a process of horizontal vibration of the vocal cords lasts as long as the pressure is reduced below critical subglotic limits, which requires new prefonatory inspiration. Phonation only begins willingly. Later during phonation frequency of vibrations, or mass, vocal cord tension and length depend on the reflex control mechanisms, especially the kinesthetic mechanism [12].

Receptors located in the mucosa, muscles and joints of pharynx play an important role in controlling kinesthetic, as medulla oblongata is informed of any physiological and pathological irritation which appeared during phonation.

In normal phonation both vocal cords vibrate with the same frequency, amplitude and phase, i.e. at the same time are approaching the center line and moving away from it. Except horizontal vibrations [6], wave like motion of the vocal cords mucosa is an important part of the vibrating mechanism, as it is an expression of its structural cha-

racteristics, which provides the necessary features of a normal voice and ensures normal phonation. Value of Fo s affected with age, sex, physical constitution, social environment, intellectual status, and laryngeal pathology, mental disorders, hearing impairment, neurological and endocrine disorders and general health. The voice is not monotone and not constant. Depends on the emotion in speech, pace, tone and strength. Our vocal and general behavior was followed with affectively.

Voice of the one person is not the same every day. Voice variations of one person, from day to day, can change in the range up to 18%. Faster vibration creates a higher tone of voice, or a higher frequency. Increased air pressure causes an increase in both intensity and a higher tone of voice. The average height of *fundamental laryngeal voic*e is: the male 120-150 Hz, in women 180-220 Hz, in children around 300 Hz. [6].

Changing the basic *laryngeal voice* makes possible national prosody and speech. When listening to vocals, *fundamental laryngeal voice* is not heard. It is heard a complex acoustic wave which consists of a series of frequencies which develop with modulation of *basic laryngeal voice* in the pharynx, hypo pharynx, oral and nasal cavity.

The tension of the voice is a muscle tension of vocal tract. They differ in two groups: laryngeal and supra laryngeal tensions that occur during phonation or articulation.

Aim

The aim of this study was to determine the basic characteristics of *fundamental laryngeal voice* (F0) with *developmental verbal apraxia.*

Methodology

The research was conducted at the *Institute for Experimental Phonetics and Speech Pathology* and in the *Department of psycho physiological disorders and speech* in Belgrade.

The sample

With adequate diagnosis conducted by an expert team: speech therapist, clinical psychologist, neurologist, it is performed a selection of children whose disorders in speech and language are diagnosed as a *developmental verbal apraxia, developmental dysphasia and developmental phonological disorders.* The sample consisted of 45 children, age between 4 and 5 years. The first group (N = 15) were children with diagnosed *developmental verbal apraxia*, the second group (N = 15) children with diagnosed *developmental dysphasia*, and a third group (N = 15) included the children with diagnosed *developmental phonological disorders*. The groups were equalized in relation to the age. The survey was conducted individually.

Measuring Instruments

Test for assessment of basic laryngeal voice- laryngogram

With laryngogram were observed properties of the voice in the correlation relation. This test covers four main fields and two scales that determine the *tension* and *pitch*. The tension has six level of possible deviations from normal, three indicating elevated (plus), and three reduced tension (minus).

Pitch also has six marks for deviation: three for the increased (plus), and three for a reduced height (minus). The first field in the central part of the *laryngogram* is a normal voice. At the first level of deviation, field labeled with number 1 is the first level of deviation from normal voice, and that field surrounds field of normal voice.

Deviation moves to the increase of the voice - plus position (1), or decrease of the voice - minus position (-1). Increased voice (1) is the result of the first degree (1) tension of the vocal cords, and low voice of minus position (-1). Thus, the high voice of the first degree (1) occurs in correlation with the tension of the first degree (1), and low voice of the first degree (-1) is correlated with first degree (-1) looseness.

At the second level of deviation, the second field of the *laryngogram,* which surrounds the first, imply second degree deviation such as: particularly increased voice in the plus position (2), or half whisper in minus position (-2). Particularly high voice (2) is the result of the tension of the second degree (2), and half whisper (-2) results from looseness in the second degree (-2). In the third degree of deviation, the third field is the largest; external field of the laryngogram. Third level of deviation is marked in it, i.e. highest

degree of dysphonic. Its correlates are in the plus position: tension of third level (3) leads to whistle voice (3), and minus position of the third level (-3) leads to a whisper (-3).

Marked voice features are on the left and bottom of the *laryngogram*. On the left are levels of intensity and on bottom are levels of height. Levels of intensity are entered in the squares observed by its vertical. Each of these analytical evaluations is crossed with its correlation, and gives a complete picture of *fundamental voice.*

In the corresponding squares are therefore entered as many labels as there are objections, and labeling is done by entering mark "x", or hatching appropriate square field. Analysis of the primary voice by *laryngogram* is the roadmap for its correction.

Results and discussion

Childhood Apraxia of Speech (CAS) is present in children who have no evidence of difficulty with strength, or range of motion of the articulators, but are unable to execute speech movements because of motor planning and coordination disorders. This should not to be confused with phonological impairments in children with normal coordination of the articulators during speech.

In **Table 1.** are shown the results of tests obtained on the basis of *fundamental laryngeal voice.* Qualitative analysis of the results showed that:

1. group with *phonological disorders* - in 3 children (20%) in is present a low voice in the normal tension, and in 12 children (80%) normal pitch in normal tension,
2. group with *dysphasia* - 2 children (13.4%) have low voice in the normal tension, 10 children (66.6%) have normal height and normal tension, and 3 children (20%) increased tension in a normal voice,
3. group with *developmental verbal apraxia* – 4 children (26.6%) have a low voice in the first level hypotension, 1 child (6.6%) has a low voice in the normal tension, 3 children have low voice in the hypertension of second level, 3 children (20%) have raised a voice in the hypotension of second degree, 1 child (6.6%) has increased tension in normal voice, and 3 children (20%) have raised voice in the hypertension of first degree.

Many studies describe the disorders in the height of *fundamental laryngeal voice* in *developmental verbal apraxia* (a neurological disorder which is characterized by the inability of the execution of coordinated *articulator movements*, with the absence of muscle weakness and movement disorder of speech programming). From the etiological factors are singled out: genetic predisposition to *motor coordination disorder*, prenatal and natal causes, differences in speed or quality of myelination, neurological disorders, and later development of speech and language [13,14,15,16], but is not determined yet whether this is compensatory mechanism created as response to motor processing disorder [17]. It was found that dysphonic, noisy or hipper nasal voices are predominant. Disorders of height and tension of *fundamental laryngeal voice* are, in our study, present in children with *verbal apraxia* in a greater level than in children with *developmental dysphasia* and *phonological disorders*. This differs from the description of *fundamental laryngeal voice* in research dealing with *differential diagnosis and phonological disorders verbal apraxia*, where children with *verbal apraxia* have adequate voice quality, in comparison with children with *phonological disorders*, which, depending on the type of disorder have a hoarse, harsh voice and hipper nasal voice [13,14]

Conclusion

The results show that disorders of the *height and tension of fundamental laryngeal voice* present in children with *developmental verbal apraxia* are in a greater level than in children with *developmental dysphasia and developmental phonological disorders*.

Childhood Apraxia of Speech (CAS) is the term used most widely to describe difficulty in planning and programming speech movements in children. CAS is considered to be a neurological speech disorder that can occur by itself, along with other neuro-developmental disorders (such as autism), or due to accident or illness. CAS can range from mild to very severe. Children with *apraxia of speech*, in early stages of speech development, are likely to need intensive, individual, and frequent speech therapy in order to become intelligible speakers. *According to the Childhood Apraxia of*

Table 1. Survey results obtained by interviewing fundamental laryngeal voice in children with developmental verbal apraxia, developmental dysphasia and developmental phonological disorder

Tension of voice Whisper		Pitch of voice				
		Half whisper	Low	Normal	Elevated	
Develop. Phonological Disorders						
Hypotension 2 level	No.	0	0	0	0	0
	%	0	0	0	0	0
Hypotension 1 level	No.	0	0	0	0	0
	%	0	0	0	0	0
Normal tension	No.	0	0	3	12	0
	%	0	0	20	80	0
Hypertension 1 level	No.	0	0	0	0	0
	%	0	0	0	0	0

Tension of voice Whisper		Pitch of voice				
		Half whisper	Low	Normal	Elevated	
Developmental dysphasia						
Hypotension 2 level	No.	0	0	0	0	0
	%	0	0	0	0	0
Hypotension 1 level	No.	0	0	0	0	0
	%	0	0	0	0	0
Normal tension	No.	0	0	2	10	3
	%	0	0	13.4	66.6	20
Hypertension 1 level	No.	0	0	0	0	0
	%	0	0	0	0	0

Tension of voice Whisper		Pitch of voice				
		Half whisper	Low	Normal	Elevated	
Developmental verbal apraxia						
Hypotension 2 level	No.	0	0	0	0	3
	%	0	0	0	0	20
Hypotension 1 level	No.	0	0	4	0	0
	%	0	0	26.6	0	0
Normal tension	No.	0	0	1	0	1
	%	0	0	6.6	0	6.6
Hypertension 1 level	No.	0	0	0	0	3
	%	0	0	0	0	20
Hypertension 2 level	No.	0	0	3	0	0
	%	0	0	20	0	0

Speech Association of North America, with proper help, children with apraxia of speech can make great strides in speech, language and communication with appropriate help, and in many cases they can achieve progress to the point that no one could tell that they had a severe speech disorder. However, often, other speech, language, and learning difficulties co-occur with this speech disorder.

Childhood Apraxia of Speech (CAS) is present in children who have no evidence of difficulty with strength, or range of motion of the articulators, but are unable to execute speech movements because of motor planning and coordination problems. This is not to be confused with *phonological impairments* in children with normal coordination of the articulators during speech.

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Anaerobic threshold determination by direct blood lactate measurement with and without warm up protocol in female athletes

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Abstract

This research aimed at pointing out the determination of the anaerobic threshold by the direct blood lactate measurement with and without prior administration of the warm up protocol in female athletes.

Resesearch sample was drawn from 50 female athletes subjects divided into four groups: 15 non-trained subjects, prior subjected to the warm up protocol, 15 well- trained subjects prior subjected to the warm up protocol, 10 non-trained subjects, who were not prior subjected to the warm up protocol, 10 well- trained subjects who were not prior subjected to the warm up protocol.

Results obtained and presented in this paper show that AT, determined by the direct blood lactate measurement, is statistically significant ($p < 0,001$) in higher values of the heart rate in well- trained subjects compared to the non-trained subjects, equally for those subjected and not subjected to the warm up protocol before the workload test.

Key words: anaerobic threshold, blood lactate, female, athlets, conconi test

Introduction and Aim

Results obtained and presented in this paper show the importance of the AT, determined by the direct blood lactate measurement, during the training test with the aim to estimate the training status of the female athletes. Physiological principles referring to the physical activity pertain both to men and women but there are quantitative differences in the values of some parameters. Most quantitative parameters related to muscles and activities are smaller in women than those measured in men (1). Muscle capacity is defined by three basic consepts: power, strength, and endurance (2, 3), and it greatly depends on the supply of the nutrients to the muscles, that is, on the glycogene deposited in the muscles prior to the exerted work (4) and the adequate function of the cardiovascular system.

In order to contract a muscle needs energy which is generated by ATP which releases PO_3 group and transforms into ADP thus generating energy, and by releasing one more PO_3 group it tranforms into AMP, generating energy as well (4, 5). To replenish ATP, which is lacking in muscles, energy is needed and it is generated from the three metabolic systems: phosphocreatinin – crearinin and glycogen –lactic acid, which are anaerobic systems, and the aerobic system. The first two anaerobic systems are used by a muscle in short term activity and for a longer activity aerobic system of energy generation is utilized (by means of the oxygen derived from the nutrients whereby great quantity of energy is released (4, 5, 1). For exsessive power muscles use phosphate system, and in prolonged physical acitivities they use aerobic system. In between there is a glycogen –lactic acid system that is a specially important supply of energy. Muscles use aerobic way of energy supply but with the increase of physical activities oxygen lacks and the anaerobic system is activated. That breaking point when the aerebic system of energy supply is transformed into the anaerobic system is called the **anaerobic threshold** – AT (6, 7, 8). Anaerobic sytem increasingly generates lactic acid which is accumulated in muscles and then in blood. When the anaerobic threshold is surpassed it is not possible to endure long in this intensity regime. Anaerobic threshold is reached before the maximal oxygen consumption, VO2 max so it is expressed in % of VO2 max (6, 7, 8, 9).

The recovery of energy systems in muscles after training load is a complex chemical process that implies the elimination of excessive lactic

acid and replenishing of the used oxygen ('oxygen debit'), and the replenishment of the glycogen reserve. The replenishment of glycogen lasts for days and not just minutes or hours, which is enough for the replenishment of the phosphagen system and lactic acid system (4, 10).

Oxygen consumption and overall pulmonary ventilation can be increased 20 times in well trained athletes, but the respiratory system is not a decisive factor for the oxygen transport in maximal activity. Restriction comes from the cardiovascular system and depends on the tidal and minute volume of blood and heart rate (4, 9, 10).

Concept of Anaeroboc Threshold – AT was introduced for the first time in the 60 –ties of the last century, first in the clinical practice and then in sport (11, 12). Lactate system (glycogen – lactic acid) is next to the phosphogen system, a second system independent from the oxygen supply into the cells. In the glycogen – lactic acid system energy needed for the resynthesis of ATP is drawn from the carbohydrate breakdown, but only to the pyruvic acid which is then converted into the lactic acid (acidum lacticum) (13). Nowadays, it is well known that the blood lactate concentration in training and competition workload is extremely high so that the change in lactate concentration serves as an estimation of the training condition of the athlete (14). Workload intensity, when a sudden increase in blood lactate concentration is noticed, increased creation and elimination of CO_2, increase in respiratory coefficient and the exponential increase of pulmonary ventilation is designated as the anaerobic threshold (15). Anaerobic threshold is the load where the concentration of the lactic acid reaches a critical value of 4 mmol/l, which is called lactate threshold - LT and denotes the start of its accumulation in the blood (16).

The aim of our research was to determine AT in an adequate administered test of load and heart rate monitoring, by direct method of the blood lactate measuring in female subjects (well trained and untrained ones) of the federal rank of competition in collective sports (basketball, handball, volleyball and football) and to determine the influence of the prior warm up procedure on the values of the subjects' anaerobic threshold.

Subjects and methods

Research encompassed 50 female subjects divided into four groups:

I group – 15 non-trained subjects, prior subjected to the the warm up protocol,
II group – 15 well- trained subjects prior subjected to the warm up protocol,
III group – 10 non-trained subjects, who were not prior subjected to the warm up protocol,
IV group – 10 well- trained subjects who were not prior subjected to the warm up protocol.

Non-trained subjects complied to the following demands: that they are healthy, they are over 18, and they have given prior written consent to participate in the research.

Well- trained subjects complied to the following demands: that they are healthy, that they are capable of training and competing, are on the senior team in the federal rank of competition, are older than 18, are competing in basketball, handball, volleyball and football, and have at least three trainings a week, and have at least three years sports experience in their respective sports.

All subjects were measured for body weight, body height and age.

Preparation of subjects

Subjects were instructed not to take up any physical activity 48 hours prior to the onset of the test in an adequate sportsware, always the same one, in the morning hours, at the temperature of 21 ± 2Co and relative humidity of 50 ± 5%. All the subjects were informed about the test administration and the protocol.

First group of subjects (non-trained and well-trained) started the test without warm up, with the initial workload of 20W, and each minute the load was increased by 20W . After each minute heart rate and blood lactate were measured.

Second group of subjects (non-trained and well-trained) started the test with the warm up protocole. The warm up protocole envisaged riding a cycle ergometar with the workload of 20W and the increase of the workload by 20W each minute until heart rate (HR) reached 50% of the maximal heart rate for the given age. Only then did they start the test.

Sample of variables

Following variables were observed:
- Heart rate (HR) by pulse measuring,
- Concentration of blood lactate and
- Current workload expressed in power unit (W) in each lap time (in each susequent minute of the workload).

All variables were determined before the test, in any change of the workload, and in the end of the test.

Measuring equipment

A cycle ergometar "Kettler ergometer AX1" was used, pedalling speed was monitored by its constituent watch mechanism, and the individual workload was defined in power unit (W). Pulsmeter Polar 610i was used for the pulse measurement in a sitting position, after 15 minute rest of the subjects on the cycle ergometar. Time during the test was measured by the stop watch which is the constituent part of the cycle ergometar and pulsemeter.

Blood lactate determination

Concentration of the blood lactate was determined at the onset of the test and after each minute of the test (immediately before the next workload increase). Test was abrupted the moment measured blood lactate concentration was equal or bigger than 4 mmol/l. Blood samples were taken from the fingertips by capilet and then transferred to lactate – test strips that were then inserted into the lactate analyzer - Accutrend Menheim and the values of lactates were read in 60 sec. Lactate analyzer was calibrated according to the known and set lactate standards (0,5 and 15mM).

Statistical data processing

All quantification values obtained were registered as mean values and standard error, and statistical significance was tested by the Student test whereby the value of $p< 0,05$ was considered statistically significant. The obtained results were shown in Tables and Graphs.

Research results

Age, body weight and body height of the subjects were determined before the start of the testing, they were statistically processed and shown in Table 1.

The table shows homogeneity of the subjects groups, without statistical differences in age (22 -23), weight (61 – 62 kg) and height (162 – 164 cm), which makes possible the confirmation of the results validity.

Table 2 shows that there is a statistically significant difference between the well-trained and non-trained subjects who were, prior to the test administration, subjected to the warm up protocol, that is, the anaerobic treshold was determined by the direct measurement of blood lactate which is significantly bigger than ($p<0,01$) in well-trained when compared to the non-trained subjects.

Table 2 shows that there is a statistically significant difference between the well-trained and non-trained subjects who were not, prior to the test administration, subjected to the warm up protocol, that is, the anaerobic treshold was determined by the direct measurement of blood lactate which is

Table 1. Age, body characteristics (weight and height) of the subjects tested on blood lactate and heart rate in workload protocol

Subjects	N	Age	Weight (in kg)	Height (in cm)
Non-trained	25	22, 75±3,42	61,88±5,29	162,52±4,91
Well-trained	25	23, 18±4,37	62,87±4,67	164,42±5.07

Table 2. Value of the anaerobic threshold determined by the direct blood lactate measurement (4 mmol/l) in non-trained and well-trained subjects of the federal rank of competition

Groups of subjects	Without prior warm up	With prior warm up
Non-trained	**(A)** 138±5,91 (N=10)	**(B)** 141±4,14 (N=15)
Well-trained	**(C)** 154±4,17* (N= 10)	**(D)** 156±3,64* (N=15)

P<0,01(C to A; D to B)

significantly bigger than ($p<0,01$) in well-trained when compared to the non-trained subjects.

Discussion

Results presented in this paper show that AT, which was determined by the direct measurements of the blood lactate is statistically significantly formed ($p < 0,01$) at higher values of the heart rate in well trained subjects when compared to the non-trained subjects, equally so in those subjected and those not subjected to the warm up protocol prior to the workload test. This complies with the results of some other authors, that is, organism is capable of reaching the maximal increase of power in a short period of time, whereby later on this power drastically decreases. Endurance mostly depends on the supply of the nutrients to the muscles, that is on the quantity of the glycogen deposited in the muscles before the exerted effort (4, 17). In active muscles aerobic and anaerobic abilities are increased by totally 45% (1,10).

During the intensive work as is the case in elite athletes, glycolisis is so increased that mytochondriae cannot use pyruvat fast enough to prevent its accumulation in the muscle citosole. Therefore, the process of lactate creation from the pyruvat is increased and the lactic acid is accumulated during high intensity workload, which in turns enables the accumulation of the hydrogen ions in interior area, thus allowing for the occurance of acidosis (12). Grazzi et al. (18,19) state that the indicators of the exerted work that ensue from the energy metabolism during graded workload follow this scheme: aerobic threshold in on 2mmol/l lactate, aerobic – anaerobic threshold is on 2 – 4 mmol/l lactate and anaerobic threshold is on 4mmol/l of the blood lactate of the subjects. Zone of 4 trainings (81% - 90%) is the zone where the anaerobic threshold occurs, therefore it is denoted as the zone of the anaerobic threshold. Training in this zone, below the anaerobic threshold, results in the capability of the muscles to breakdown the lactic acid so longer period occurs before the onset of the muscle fatigue. This training intensity develops a high level of the aerobic – anaerobic capacity, such as the one in the elite athletes (1, 9, 10).

Nowadays, it is well known that the concentration of the blood lactate in competitive or training workload is attributed a vital role. On the basis of the blood lactate change one estimates the training capacity of the athletes (18, 19), especially in the cyclic type of activities, and the results of this research undoubtedly point out to this fact.

The application of the functional diagnostics in the athletes represents one of the preconditions of the successful training process implementation. Determination of the blood lactate concentration as a metabolic information is nowadays, due to the advance of the technology, easy and convenient procedure to administer in the labaratory but in the field as well (20). Contemporary trends in the physiology of sport tend to favour simpler and less traumatic methods, so the focus of attention is directed towards the non-invasive methods of AT determination, although one can say that they do not have real verification of the scientific public. Most famous non-invasive method of AT determination is the Conconi test, whose validity is still not adequatelly evaluated.

Special issue in sport is the procedure of warm up before the exertion of any sports activities or workload test administration. A warm up procedure is composed of sport – specific activities with graded incremental of the intensity which aims at preparing the athletes and the subjects for the oncoming activities (testings). Adequate warm up procedure before the sports activities inluences the increase of the body temperature, speeds up metabolic processes and optimizes the status of the muscle and cardiovascular system (20). If we take into account that warm up influences the value of the anaerobic threshold (21, 22), it is quite clear that it is not real to expect the concordance of the results in the studies where the test was administered after the warm up, with the low workload intensity (20W duration of 4 min) with the studies where the test was administered after the warm up, with the graded incremental workload intensity lasting 15 to 20 minutes (23). Results of this paper do not show statistically significant difference in AT in the subjects that have and have not undergone prior warm up procedure protocol but both groups of subjects, well trained and non trained ones exhibit AT development on a higher level of heart rate frequency.

Direct method of AT determination by means of the blood lactate measurement is a reliable and accurate method but it requires special preconditi-

ons because it represents the case of so called "bloody method" so it is more appropriate in the routine work in sport to administer the indirect, non-invasive methods such as the Conconi test. Rosić et al (24) have shown that the values of the heart rate where the AT occurs, are statistically higher ($p<0,05$) when compared to the values when AT is determined by the blood lactate measurement. According to the aforementioned authors the Conconi test can be used nonetheless because of its easy administration with the precondition to provide the adequate interpretation in the assessment of the training capability in all sports activities.

Conclusion

Direct method of AT determination by means of the blood lactate measurement is the most reliable and most accurate method. It can be, and should be used, in the training process in order to estimate the training capability of the athletes. Prior warm up procedure changes AT and conditions its occurance in the higher values of the heart rate when compared to the absence of the warm up procedure administration.

Acknowledgments

We would like to express our gratitude to the Ministry of Education and Science for their support in the project OI 179019 – Biomechanic efficiency in elite Serbian athletes", and also to the athletes who participated in this research.

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Stand-alone posterior ressection of lumbar hemivertebrae: case report

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Abstract

Background: In this case report we presented the stand-alone posterior approach for hemivertebra resection with unilateral laminar hooks.

Case report: The patient was male and five years old. The coronal and sagital X-Rays images showed a failure of vertebral formation, segmented hemivertebra of third lumbar vertebra. The segmented hemivertebra caused a thoracolumbar scoliosis from T12 to L4 (rightside convexity), of 30 degrees (Cobb angle). The patient was submitted to a hemivertebra resection from posterior approach with two unilateral laminars hooks stabilization (superior lamina in L2 and inferior lamina of L4) in association to a compression system and autologus bone graft. The coronal X-Ray image after surgery showed a partial improvement to 25 degrees (Cobb angle) between L2 and L4. After three years of follow up it was not observed system failure (hook pull-out), maintance of curve (25 degrees of Cobb angle) and correction of trunk inbalance.

Conclusion: The hemivertebra resection with posterior approach is safe, with satisfactory correction of scoliosis curve, which means is a good choice for congenital scoliosis surgical treatment.

Key words: Congenital malformations; Scoliosis; Hemivertebrae .

Introduction

Currently, orthopedic sciences have received important attention [1-5]. Congenital scoliosis is the result of the formation of anomalous vertebral elements that cause the deviation of the vertebral alignment. These changes occur during embryonic development in utero, i.e., in the first six weeks of gestational age [6].

The type of the hemivertebra is the most important factor for the formation of scoliosis and its classification depends on the growth potential and may be characterized by the presence of the growth plate and intervertebral disc [6-8]. The partially segmented hemivertebra is characterized by the presence of an adjacent vertebra with synostosis in one of the intervertebral plateaus (i.e., the upper plateau) and the presence of disc and growth plate in the opposite segment (i.e. lower plateau). The non-segmented hemivertebra is attached to adjacent vertebrae (synostosis), not presenting, consequently, disk, and determining the growth plate. Therefore, an angular deviation of lesser magnitude and without potential growth [6, 9].

The treatment depends mainly on the type of hemivertebra, location, magnitude and progression of curvature. The brace treatment was not very effective in congenital scoliosis due to the bending stiffness of the primary, however, it is usually effective in secondary flexible curvatures [10, 11]. Surgical treatment aims to stop or slow the progression of the curvature and, if possible, restore spinal alignment. The surgical approaches and techniques range from the fusion in situ, associated or not with anterior or posterior instrumentation, with hemiepifisiodesis and resection of the fused hemivertebra [12].

Resection of the hemivertebra is a procedure that allows the restoration of spinal alignment and stabilization (arthrodesis). It is associated with a pronounced neurological risk, however, it is held below the conus, which varies in location depending on the patient's age, it is a safe procedure. This procedure is commonly used for the treatment of

lumbar hemivertebra, which are associated with an imbalance of the body (secondary curve) and may be accomplished by several approaches: the anterior, posterior or the both [13].

In view of the above consideration, we aimed to present a case report regarding the stand-alone posterior approach for hemivertebra resection with unilateral laminar hooks.

Case report

Male patient, five years old without pain complaints or neurological impairments, presenting as congenital agenesis of the right thumb and ventricular septal defect, which was surgically corrected previously. The radiographs in anteroposterior and profile showed a partially segmented hemivertebra of the third lumbar vertebra (L3), causing a thoracolumbar scoliosis between T12 and L4 (convexity to the right), the magnitude of 30 ° (Cobb angle) at 4 years old with rapid progression to 45 ° at 5 years old (Figure 1). In the lumbar the 3D computed tomography (CT) with reconstruction we noted the segmentation of the hemivertebra (Figure 2). The magnetic resonance image (MRI) showed no changes in the spinal cord (Figure 3).

Figure 1. Radiograph showing the presence of lumbar hemivertebra that developed to lumbar scoliosis

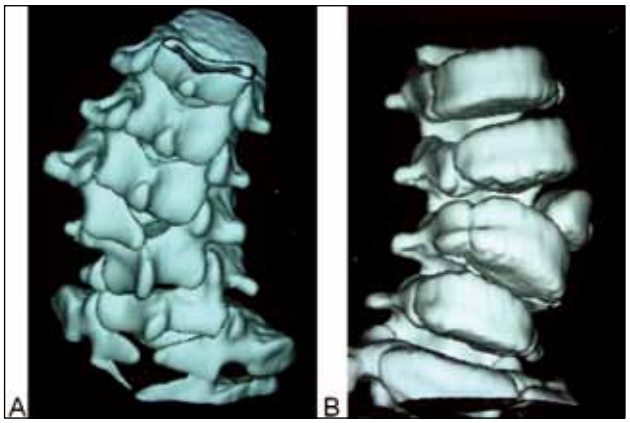

Figure 2. Lombra tomography (3D CT). (A) One blade formation. (B) Segmentation of the intervertebral disc

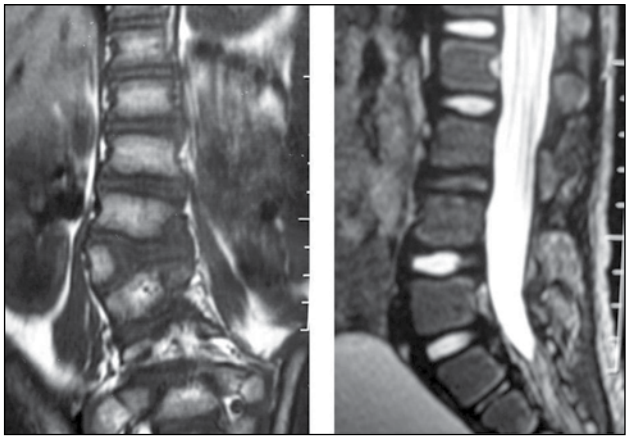

Figure 3. Magnetic resonance image (MRI) showing absence of compression of lumbar nerve structures

Surgical techinique

The posterior approach was performed by median lumbar incision of 8cm. The subperiosteal dissection of the posterior vertebral elements was made according to the Cobb technique for the visualization of the blades, facet joints and transverse processes of L2 to L4 bilaterally.

After visualization of the posterior elements of the hemivertebra (L3), it was performed a resection of the lamina, spinous process, transverse process and the posterolateral aspect of the pedicle, allowing visualization of neural elements. The dural sac was mobilized medially and protected with retractors dura, the nerve root of L2 has been protected and mobilized superiorly and L3 nerve root was inferiorly protected. This allowed complete visualization of the posterior aspect of the vertebral body of the hemivertebra (L3) and the transition to the adjacent vertebrae (L2 and L4). It was resectioned from the

rest of the pedicle, vertebral body and intervertebral discs. For protection of vascular structures, a retractor was positioned anterior to the vertebral body. The stabilization of the segment was done using the system with two interlaminar hooks (top in L2 and bottom in L4) associated with the compression system and lock it. After preparing the site of fusion, autologous bone graft (obtained from hemivertebra) was placed posterolaterally between the transverse processes of L2 and L4. At the post operative period, it was used a plaster cast bivalve thoracolumbar during the first three weeks, followed by control X-rays in the following days.

The anteroposterior radiography in the postoperative control showed partial restoration of the curve to 25° (Cobb angle) between L2 and L4 (Figure 4). After three years of follow-up there was no system failure (release of the hook). There was maintenance of correction - curvature of 25° (L2-L4) -, patient misalignment correction and maintenance of the trunk.

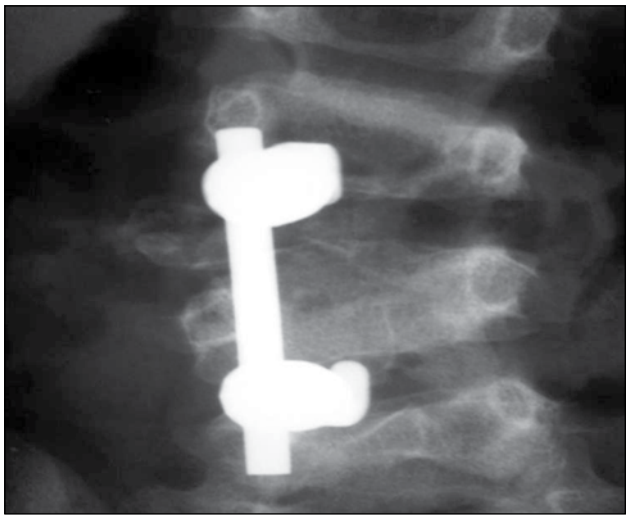

Figure 4. Postoperative radiograph showing the attachment and removal of the vertebral body

Discussion

Congenital scoliosis is caused by abnormalities of the spine that cause misalignment of the shaft and promotes biomechanical imbalance of the trunk during growth. A previous study [6] evaluated the natural history of congenital scoliosis and demonstrated that the abnormality is most commonly caused by an unilateral hemivertebra failure of vertebral formation. According to McMaster and David [7], the risk of progression of the deviation (curvature) is related to the type of hemivertebra, location, number and age [7]. Most of the hemivertebra has growth potential due to the presence of the growth plate (subtype targeted and partially-segmented), which further increases the chance of deviation from the alignment of the spine. This deviation is caused by hemivertebra considered as primary and, in most cases, promotes decompensation of the trunk due to formation of a secondary curvature (compensatory). Initially, these secondary curvatures present flexibility, however, in most cases, it progresses to the structural rigidity, not able to receive conservative treatment [9]. The secondary deformities that have stiffness are difficult to handle and increase the risk of neurologic impairment [6, 11]. Surgical treatment early in order to counteract the disease progression (progression to secondary curvatures rigid) becomes necessary [12].

According to our study, there was a positive effect of combined approach. Several studies showed that the combined approach (anterior and posterior) provides the correction of curvature between 24% to 71%. Nevertheless, it was observed a marked morbidity (blood loss, infection and neurological risk) [14, 15]. The advent of new forms of posterior fixation (pedicle screws and hooks) associated with intraoperative electrophysiological monitoring allowed the evolution of the technique of hemivertebra resection by posterior approach. Ruf and Harms [16] in 2002, described the results of 21 patients who underwent resection of the hemivertebra by posterior approach with transpedicular instrumentation. The initial curvature (Cobb angle) was 41º, which was reduced to 14° in the immediate postoperative period (66% reduction) and 15º after two years of follow-up. Other studies showed similar results: Shono et al [17] reported 12 cases of hemivertebra resection by posterior approach with an average correction of around 63.3%. Nakamura et al [18] reported 5 cases with an average correction of 54.3%. Resection of the hemivertebra by the posterior approach has been shown to be safe (low rate of complications) and provided satisfactory correction of the curvature.

In our case we chose to use the technique for resection of the hemivertebra by the posterior approach because of the lower morbidity of the procedure when compared with the combined approach and provided satisfactory results of correction of the curvature magnitude. We used instrumentation with laminar hooks, it allowed the assistance of the correc-

tion due to compression of the convex curvature and ensuring a lower risk of injury to nerve structures. Radiography in the immediate postoperative period showed a reduction in curvature in 40% and this result is similar to that found in the literature [17-19]. There were no postoperative complications (infection and neurological deficit). Follow-up after three years showed maintenance of correction of curvature in 25º, there was no failure of the instrumentation system (breaking or loosening) and the patient presented secondary correction of misalignment of the trunk. The difficulties found in performing this technique included incomplete resection of the posterior portion of the body due to the proximity of the hemivertebra with previous vascular structures, as demonstrated in other studies [15, 17-19]. For this reason, we suggest the implementation of preoperative imaging to a proper understanding of the anatomy of bone malformation. The anteroposterior and lateral radiographs allow diagnosis of the anomaly (segmentation fault, training or combined), the location and number of defects.

In conclusion, resection of the hemivertebra by posterior approach is a safe technique with satisfactory correction of scoliotic curvature. We indicated this procedure as a good alternative for the treatment of rigid congenital scoliosis.

Acknowledgements

This study received financial support from FMABC.

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Clinical presentation of hospitalized Erysipelas cases

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Abstract

Introduction: Erysipelas is acute dermoepidermitis most often caused by group A beta-haemolytic streptococci. The disease is more common in females, older age, immunocompromised persons and those suffering from chronic diseases.

Goal: to determine distribution of erysipelas patients related to sex and age, predisposing factors, clinical characteristics related to sex and duration of hospitalization.

Methods: Retrospective analysis of medical histories of 86 erysipelas patients (54 females, 32 males) hospitalized at the Clinic for Infectious Diseases, Clinical centre of Vojvodina during 3-years period was made. In the studied patients the following parameters were monitored: demographic data (sex, age), predisposing factors for erysipelas, clinical characteristics of disease, duration of hospitalization, type and duration of used antibiotic therapy and outcome of disease. Statistical analysis was performed by using χ^2-test and t-test.

Results: Most of involved female patients were 70 to 79 years old; the majority of males were 50 to 59 years old. The most common localization of erysipelas was lower leg, both in females (68.6%) and males (81.3%). The most common clinical form of erysipelas in both sexes was classic form (51.8% of females, 46.9% of males). Most common clinical characteristics in both sexes were fever, general complaints and local signs of inflammation, leucocytosis with polynucleosis, elevated sedimentation rate and elevated serum fibrinogen. When it comes to clinical manifestations of erysipelas, significant differences in relation to sex were not found. There was a statistically significant difference in terms of average values of ALT ($t=3,0323$, $p<0,05$), and average values of AST ($t=2,0244$, $p<0,05$) between genders, in favour of males. Average duration of antibiotic treatement was 15 days in females and 14 days in males. Average duration of hospitalization was 14 days in females vs. 13 days in males.

Conclusion: In our study erysipelas occurred more often in females. The majority of females with erysipelas belonged to age group of 70-79 years, but males most commonly suffered from erysipelas at age of 50-59 years. The most significant predisposing factors in both sexes were diabetes mellitus, chronic heart and blood vessel diseases, obesity, and alcohol abuse among males. Erysipelas was clinically expressed most commonly with fever, general complaints, local signs of inflammation and leucocytosis. There was statistically significant increase of alanine- and aspartate- aminotranspherase among males. The outcome of disease was favourable and complications were rare. There was no fatal outcome among studied erysipelas patients. A notable number of relapsing erysipelas cases was recorded.

Key words: erysipelas; group A beta-haemolytic streptococcus; clinical presentation.

Clinical presentation of hospitalized erysipelas cases

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Introduction

Erysipelas is acute dermoepidermitis that characteristically extends into the cutaneous lymphatics [1]. In the Middle Ages it was known as St. Anthony's Fire, named after an Egyptian healer who successfully treated the infection [2]. Erysipelas is usually caused by group A beta-haemolytic streptococci (Streptococcus pyogenes), less commonly by group C, D and G streptococci. Group B streptococci are the most common cause of erysipelas in newborns. Very rarely, a similar skin lesion may be caused by S. aureus [3].

Reservoir of infection is a person with streptococcal infection or streptococcal carrier state [4, 5]. Particularly vulnerable are the elderly and immunodeficient persons or those with chronical diseases (diabetes, alcochol abuse, AIDS, nephrotic syndrome). Predisposing factors for erysipelas is also skin damaged by malnutrition due to peripheral venous insufficiency or atherosclerosis, increased air humidity and cold, pregnancy [2, 3, 6]. In the neonate, erysipelas may develop from an infection of the umbilical stump [3, 7]. Having the disease does not leave immunity afterwards; on the contrary, disposition for relapses occurs [4].

Erysipelas affects individuals of all races, more commonly female ones [2].

Incubation period lasts from few hours to 3-4 days. The disease starts abruptly with constitutional symptoms: temperature rises to 39,5˚C, accompanied by fever, sometimes by nausea and vomiting. Few hours later there are local signs of skin inflammation. Inflammation area is clearly demarcated by surrounding healthy skin, expands rapidly ("red wind") and rises above the plane of the skin due to elastic edema ("erysipelas' plate"). Affected skin is hot, tight, shiny, skin structure is wiped out ("peau d' orange"). There is a maximum sensitivity with palpatory pain at the periphery of erysipelas skin lesion [1, 6]. Untreated disease comes to peak at 5th to 7th day, meanwhile temperature is increased, headache intensifies, the patient is exhausted. Then temperature falls, all signs of infection calm down and disappear. After withdrawal of skin inflammation signs, involved skin undergoes desquamation. Untreated, moderate form of erysipelas lasts for 8-10 days [6].

The commonest site of involvement are lower extremities (80%), face, trunk and arms [1,6]. Facial erysipelas is often preceded by rhinitis or nasopharyngitis. The changes are first seen on the nose, presenting with butterfly rash, then spread above to the hairy part of head and downward to nasolabial folds [1]. Erysipelas of the scalp is a severe disease with constitutional symptoms, pasty scalp edema with unclear boundaries. Erysipelas of the auricle is usually accompanied by moderate fever, itching of outer ear and ear canal, a sense of tension and tenderness; constitutional symptoms are mild or absent [6].

Clinical forms of erysipelas are: classical, vesiculous, bullous, haemorrhagic and gangrenous form [4, 6].

According to the predisposing factor and the portal of entry for causative agent, erysipelas may be spontaneous (with unknown or known portal of entry), post-traumatic (due to trauma, fungal infection or eczema) and post-operative (after mastectomy or vulvectomy) [1, 5].

Complications may be local and general. Local complications include cellulitis, purulent lymphadenitis, conjunctivitis, keratitis, retrobulbar phlegmona [1, 6]. Elephantiasis is a late complication occuring due to narrowing of lymphatic vessels and lymphostasis as a consequence of frequent episodes of erysipelas. General complications are sepsis, intersticial nephritis, pneumonia, pulmonary thromboembolism, meningitis [1, 8].

Diagnosis of erysipelas is made on the basis of case-history, epidemiological data, clinical finding and course of disease. Complete blood count (CBC) reveals leukocytosis with polynucleosis. Sedimentation rate is elevated as well as serum fibrinogen [1, 6]. The differential diagnosis of erysipelas includes cellulitis, phlegmona, abscessus, shingles, dacriocystitis, thrombophlebitis [4, 6]. Prognosis is good for properly treated immunocompetent patients [8].

Erysipelas treatment is symptomathic and causal. Sympthomatic therapy includes bed rest, elevation of involved extremity, antipyretics, antiseptic dressing, rehydration, sometimes

diuretics, as well as proper skin care [1, 6]. Causal therapy of choice is a ten-day course of penicillin. In penicillin allergy, antibiotic alternative is erythromycin. Cephalosporins are also used, primarily first-generation [1, 3, 7]. Comparing the consumption of certain groups of medicines

(psychotropic and antibiotic drugs) throughout their utilization in Clinical Pharmacy of Clinical Centre of University of Sarajevo (CCUS), during three years and the year 2007, the consumption of antibiotics shows a decreased trend. However, the most increased consumption trend among antibiotics is registered for ceftriaxone, ceftazidime, while the most negative consumption trend is registered for cefuroxime [9]. Recurrence should be treated the same way as the first attack. There is no specific prophylaxis [1] .

Goal

- to determine number of erysipelas patients hospitalized at the Clinic for Infectious Diseases, Clinical centre of Vojvodina during three-year period, sex and age distribution and predisposing factors for the occurrence of the disease;
- to determine clinical characteristics of erysipelas (symptoms and physical findings, body temperature, localization and clinical form of erysipelas, laboratory findings, course of disease, type and frequency of complications) related to sex;
- analysis of type and duration of used antibiotic therapy and duration of hospitalization in erysipelas patients related to sex.

Methods

The study is based on a retrospective analysis of medical histories of erysipelas patients hospitalized at the Clinic for Infectious Diseases in Novi Sad from January, 2005 to December, 2007. In the studied patients the following parameters were monitored:

- demographic facts (sex, age);
- predisposing factors for erysipelas;
- clinical characteristics of disease (symptoms, physical findings, duration of fever and the average value of body temperature during the first three days of hospitalization, clinical forms and localization of erysipelas, laboratory tests on admission- CBC, biochemical findings of urin, fibrinogen, urea, creatinine, total and direct bilirubin, alanine- aminotranspherase and aspartate- aminotranspherase, serum protein-electrophoresis);
- duration of hospitalization;
- type and duration of used antibiotic therapy;
- outcome of disease.

Distribution of patients by sex and age, the prevalence of specific localizations and clinical forms of erysipelas, predisposing factors and clinical characteristics are presented in percentage (%), in the form of tables or charts. Statistical analysis was performed by using the χ^2- test and the t- test.

Results

Retrospective analysis revealed that there were 86 patients - 54 females (62.8%) and 32 males (37.2%) treated at the Clinic for Infectious Diseases in Novi Sad, Clinical Centre of Vojvodina under diagnosis of erysipelas during the observed 3-year period. There was no statistically significant sex-related difference among involved patients. Among females suffering from erysipelas, the most common represented age group was 70-79 years (33.3%). The majority of males with erysipelas belonged to age group of 50-59 years (37.5%) (Table 1).

Table 1. Age and sex structure of erysipelas patients

Age groups (years)	Gender			
	females		males	
	n	%	n	%
30-39	-	-	1	3.1
40-49	7	13.0	5	15.6
50-59	14	26.0	12	37.5
60-69	12	22.2	7	21.9
70-79	18	33.3	5	15.6
80-89	3	5.5	2	6.3
Total	54	100.0	32	100.0

$\chi^2=3,38$, **p>0,05**

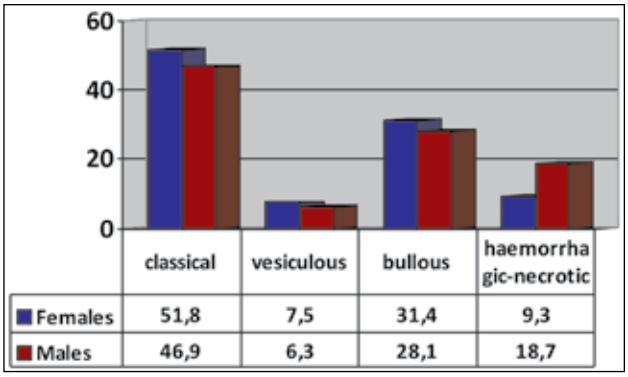
The most common localization of erysipelas in involved patients was lower leg, both in females (37 - 68.6%) and males (26 - 81.3%) with no significant sex-related differences (Table 2).

The most common clinical forms of erysipelas among females were classic (28 - 51.8%) and bullous form (17 - 31.4%). Males most commonly suffered from classical form (15 - 46.9%) (Chart 1).

Table 2. Localization of erysipelas

Localization	Gender			
	females		males	
	n	%	n	%
face	6	11.1	3	9.4
lower leg	37	68.5	26	81.3
auricle	3	5.5	-	-
arm	5	9.4	1	3.1
thigh	3	5.5	1	3,1
buttocks	-	-	1	3.1
Total	54	100.0	32	100.0

χ^2=1,52, **p>0,05**



χ^2=1,6, p>0,05

Chart 1. Clinical forms of erysipelas among females and males

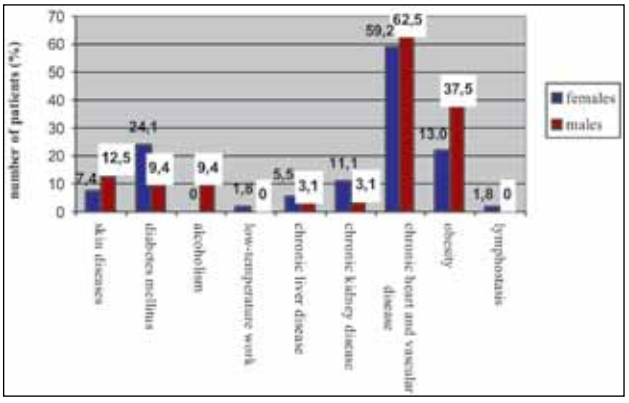
Table 3 presents clinical characteristics of erysipelas. Loss of appetite was present in all patients. Fever was registered in two-thirds of females (36 - 66.7%) and three-quarters of males (23 - 71.9%), but the statistically significant difference between genders was not proven. The average body temperature during the first three days of hospitalization ranged from 35.8°C to 39.2°C (average of 37.2°C) in females, whereas in males it ranged from 36.0°C to 40.0°C (average of 37.1°C).

Chills was present in half (36 - 57.4%) of females and in three-quarters (23 - 78.1%) of males, with no statistically significant sex-related differences. Significant differences in relation to sex were not found when it comes to other clinical manifestations of erysipelas (Table 3).

The most common predisposing factors for development of disease in both sexes were chronic heart and vascular disease, diabetes and obesity. In terms of predisposing factors there was no statistically significant difference between genders (Chart 2).

Table 3. Clinical presentation of erysipelas

Clinical findings	females		males		
	n	%	n	%	
fever	36	66.7	23	71.9	p>0,05
chills	31	57.4	25	78.1	p>0,05
exhaustion	7	13.0	1	3.1	p>0,05
vomiting	11	20.4	2	6.2	p>0,05
muscle pain	1	1.8	2	6.2	p>0,05
joint pain	2	3.7	1	3.1	p>0,05
local tenderness	30	55.5	20	62.5	p>0,05
itching	2	3.7	4	12.5	p>0,05
edema	31	57.4	19	59.4	p>0,05
redness	49	90.7	29	90.6	p>0,05
regional lymphadenitis	13	24.1	9	28.1	p>0,05



χ^2=7,34, p>0,05

Chart 2. Predisposing factors for erysipelas

Table 4 shows mean values of laboratory parameters in involved patients. In a half (50%) of females there was reduced haemoglobin level, decreased lymphocytes were found in 58%, elevated sedimentation rate in 93.9%, and high fibrinogen level in 94% of females. As for males, all of them (100%) had elevated sedimentation rate, 92.6% had high fibrinogen level, 53.6% had evidence of elevated ALT. Elevated AST was found in 46.4% of males. There was a statistically significant difference between genders in favour of males, both in terms of average values of ALT (t=3,0323, p<0,05), and average values of AST (t=2,0244, p<0,05). There was a difference in α_2-globulin values in females and males (65.7%/39.1%), but with no statistical significance.

Proteinuria was present in five females (10.4%) and six males (19.3%). The presence of pus in urine was found in 5 females (10.4%) and 2 males (6.4%), while the other urine analyses were normal.

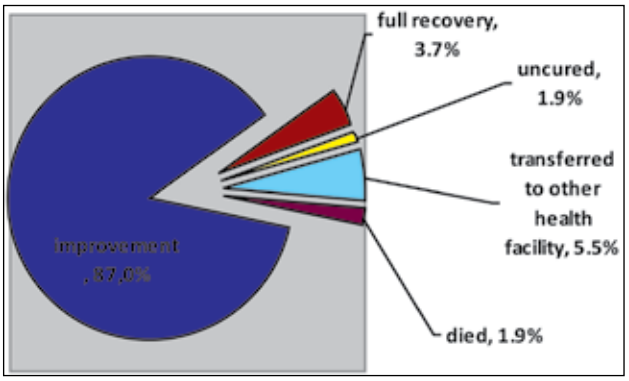
Table 4. Average values of laboratory findings among erysipelas patients

Laboratory findings	Gender		
	females	males	
erythrocytes (x 10^{14}/l)	4.27	4.38	p>0,05
hemoglobin (g/l)	118	134	p>0,05
leukocytes (x 10^{9}/l)	10.4	10.8	p>0,05
platelets (x 10^{9}/l)	282	259	p>0,05
neutrophils (%)	70.3	65.2	p>0,05
limphocytes (%)	19.8	21.4	p>0,05
monocytes(%)	6.9	7.9	p>0,05
ESR	67	58	p>0,05
fibrinogen (g/l)	7.02	6.69	p>0,05
urea (mmol/l)	7.17	6.18	p>0,05
creatinine (mmol/l)	100	99	p>0,05
total bilirubin (mmol/l)	9	14	p>0,05
direct bilirubin (mmol/l)	2.02	3.1	p>0,05
ALT (J/l)	27	61	t=3,03, **p<0,05**
AST (J/l)	26	52	t=2,02, **p<0,05**
total proteins (g/l)	65.0	69.0	p>0,05
albumins (g/l)	34.5	38.2	p>0,05
α_1-globulin (g/l)	3.0	2.7	p>0,05
α_2-globulin (g/l)	7.6	6.6	p>0,05
β-globulin (g/l)	6.9	7.6	p>0,05
γ-globulin (g/l)	13.5	14.3	p>0,05

Observing complications of erysipelas among female patients, the most common one was cellulitis (9-16.7%), while other complications such as thrombophlebitis (2-3.7%), and phlegmona (2-3.7%) were more rarely recorded. In female patients, the following bacteria were isolated from the fluid taken from bulla: Staphylococcus spp. coagulase negative (3 patients), Acinetobacter spp. (3 patients), Pseudomonas aeruginosa (2 patients), Escherichia coli (1 patient), Enterococcus spp. (1 patient) and Streptococcus agalactiae (1 patient). Identical complications were noted in male patients: cellulitis, as the most common complication (4-12.5%), was followed by phlegmona (1-3.1%) and thrombophlebitis (1-3.1%). Bacteriological examination of the fluid from bulla revealed the presence of Staphylococcus aureus (1 patient), Staphylococcus spp. coagulase-negative (2 patients), whereas Candida spp. was isolated from bullae in 1 male.

Relapses of erysipelas were the reason for hospitalization in 10 females (18.5%) and 8 males (25.0%). In other patients, that was the first episode of erysipelas.

Erysipelas had a favourable prognosis in majority of patients of both sexes. On discharge, improvement was noted in 87% of the affected female patients and even in 93.8% of males, but without statistically significant difference between genders. Three female patients (5.5%) were moved to other wards, either due to deterioration of the underlying disease or physical therapy (Chart 3a and 3b).



$\chi^2=2,28, p>0,05$

Chart 3a. Outcome of disease among females

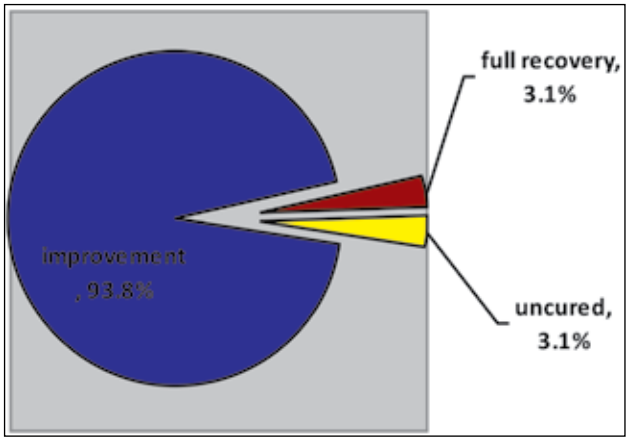


Chart 3b. Outcome of disease among males

The examined patients were treated with penicillin, cephalosporins, glycopeptides and sulphonamides. Average duration of antibiotic treatement was 15 days (7-36 days) in females and 14 days (5-23 days) in males. After withdrawl from the hospital, treatment was proceeded in 25 females (46.3%) and 14 males (43.7%).

Average hospital treatment duration was 14 days (range 6-40 days) in females and 13 days (range 3-22 days) in males.

Discusion

According to statistics made in England in the period 2002 -2003, among patients hospitalized due to erysipelas, significantly higher proportion belonged to females (65%: 35%) which agrees with the results obtained in our study [10].

The 10-year study of Masmoudi and associates enrolled patients aged from 37-80 years with erysipelas after breast cancer treatment; age of patients from our study was 30-89 years. The majority of female patients from our study was in age of 70 - 79 years (33.3%), while most of male patients in our study belonged to the age category of 50 - 59 years (37.5%) [11]. Age delayed appearance of erysipelas in females compared with males could be explained by longer life expectancy and, consequently, more frequent chronic diseases in older ages. In England, in year 2002 and 2003, 56% of hospitalized erysipelas patients were aged 15 - 59 years, while the age of 75 years was present in 9% [10]. At the same 2-year period (2002-2003), Gvozdenović and associates from Institute for Infective and Tropical Diseases, Clinical Center of Serbia, established erysipelas like the most common among patients of the 7th decade (40%) [5].

In seven hospital centers in France, Dupuy and colleagues questioned 129 of 167 hospitalized erysipelas patients, according to age, sex and duration of hospitalization, where 5% of them had first episode and 18% relapse of erysipelas [12]. In our study, relapsing erysipelas was the reason for hospitalization of total of 18 patients, 10 females (18.5%) and 8 males (25.0%). Other patients suffered from the first episode of illness. In Eriksson and associates' study (from University Hospital in Sweden), the relapse of erysipelas was the cause of hospitalization in 21% of 229 erysipelas patients [13]. Gvozdenović' study has revealed even higher incidence of relapses (35%) in 60 erysipelas patients [5].

Dupuy and colleagues in their research found a significant association with erysipelas of the legs and varicose veins or neurological disorders, but the influence of alcohol, diabetes mellitus, smoking and sitting at work on the occurrence of erysipelas of the legs could not be confirmed [12]. Research of Ronnen and associates, which involved 526 adult patients in the Sheba Medical Center from 1972 to 1982, marked a local trauma and superficial skin lesions as the main predisposing factors for development of erysipelas, while peripheral vascular disease, diabetes mellitus, steroid therapy, radiotherapy essants or radiation are less involved in the development of disease [14]. Contrary to the literature data, the most important predisposing factors for erysipelas in our study in both sexes were chronic heart and vascular disease, diabetes mellitus and obesity. Such results are probably the consequence of well-known inadequate eating habits and unacceptably high smoking rate among human population of Province of Vojvodina.

According to Ronnen's study, 86% of lesions was localized on the lower extremities, and 5.9% on the face [14], whereas in our study the lower leg - erysipelas was present in 37 (68.5%) females and 26 (81.3%) males, and facial erysipelas in 6 (11.1%) females and 3 (9.4%) males.

Average values of erythrocyte sedimentation rate in the study of Masmoudi were about 17 mm/h [11], whereas in our patients were much more - in females on average 67 mm/h, and in males on average 58 mm/h. In research of Gvozdenović and associates, average values of elevated fibrinogen level were moderate- 5,6 g/l, while we found higher fibrinogen level in our patients- 7,02 g/l among females and 6,69 g/l among males [5].

Significantly higher values of AST and ALT in males could perhaps be explained by deterioration of some underlying hepatic diseases within the course of erysipelas which are more frequent in men, for example, alcocholic liver disease.

Duration of erysipelas treatement was similar in both, our research (for females 7-36 days, an average of 15 days and for males - 5-23 days, an average of 14 days) and in that one of Masmoudi (11-25 days, an average of 16 days) [11]. According to statistics in England 2002 - 2003, the average duration of hospitalization for erysipelas was 4 days [10], while the average length of hospitalization of our patients was much longer- an average for females was 14 (6–40 days), for males 13 days (3–22 days).

Conclusion

In a retrospective study conducted during three-year period at the Clinic for Infectious Diseases, Clinical Centre of Vojvodina, clinical characteristics of erysipelas among 54 female patients and 32

male patients were analyzed. In our study erysipelas occured more often in females, mostly at age group of 70-79 years. The most significant predisposing factors in both, males and females, were diabetes mellitus, chronic heart and blood vessel diseases, obesity and plus alcohol abuse among males. Erysipelas was most commonly presented with fever, general complaints, local signs of inflammation and leucocytosis. The most common localization were lower extremities in both sexes. There was statistically significant increase of alanine-aminotranspherase and aspartate-aminotranspherase among males. With proper treatement, the outcome of disease was favourable and complications were rare in most cases. There was no fatal outcome among studied erysipelas patients. A notable number of relapsing erysipelas cases was recorded.

Shortcuts

CBC- Complete blood count
AST- Aspartate-aminotranspherase
ALT- Alanine-aminotranspherase
ESR- Erythrocyte sedimentation rate

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Team Effectiveness in Hospital Management: A literature Review

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Abstract

Objectives: The purpose of this paper is to review the research on team effectiveness in hospital management. The literature was reviewed to regulate how the idea of team effectiveness, defined and what recommendations have been made as to how to manage hospitals.

Review methods: A search of OVID recourses, ISI Web of Science and googlescholar was conducted which combined the keyword search terms "team", "team effectiveness", "hospital", "hospital management", "management", "administration", High quality studies were selected and collective with studies identified to the authors. The article was further developed according to the management knowledge of the author in hospital management. We also contacted manufacturers and researchers in the field and considered articles published in english language.

Results: The results relating to team effectiveness were few; therefore 'hospital management' was included which increased the amount of material. References that were deemed useful from bibliographies of relevant journal articles were included. The inclusion criteria were articles that provided information about the effectiveness and, hospital management backgrounds.

Conclusion: Most of the literature emphases on the cognitive aspects of hospital management. This generic approach can, lead to hospital management. A growing body of literature also confirms that effective work groups have become more important in hospitals, as pressures grow to manage resources more effectively and complexity increases. The paper shows that team working approach can help to manage resources, improve task performance, learning and communication.

Key words: Team effectiveness, hospital, management

Introduction

Most managers believe teamwork is important to the success of their department and company [1]. Research into team effectiveness has traditionally searched for characteristics of effective teams. Quantitative evaluations of specific interventions have largely been inconclusive and emphasized the need for further research [2]. There is a great interest in studying organizational teams. This interest is concerned with the increasing use of teams in hospitals [3]. Members of organizational teams are interdependent in a number of ways. In many cases, team members depend on each other for individual task completion. Such task interdependence needs to be distinguished from outcome interdependence, that is, the extent to which team members' outcomes depend on their personal or team performance [4]. The importance of teamwork to delivering healthcare, a better understanding of how teams function effectively will be invaluable for educating and developing teams. Hospitals and other organizations can be dissected into anatomical and physiologic subsystems: space, equipment, personnel, tasks, policies and rules, hierarchy, cost control, governance, etc. These systems have to work together to achieve organizational goals and in doing so form healthy and effective beings. Hospital effectiveness has made enormous strides in the last two hundred years. Hospital management is much more sophisticated today.

The last years have seen its development from amateur status to skilled professionalism. This might explain why administratively caused efficiency differences may have diminished. Currently, two parts of hospital organization lag far behind: medical staff organization and governance. Physicians are only beginning to become interested in management and most trustees remain amateurs. Perhaps

this is why studies in these areas show strong associations with hospital effectiveness. Perhaps in twenty years these areas will have improved sufficiently that these correlations will vanish. Healthcare teams are often large, due to norms of professional representation, regardless of contribution to patient care. Further, it is often unclear as to whether patients and their families are team members[5]. The purpose of this paper is to report on a team effectiveness literature review. While almost concentrated on team effectiveness in hospital management, this paper broadens the focus to include team effectiveness in hospital management. Also, while it is important to recognize team effectiveness sources and effects prior to exploring hospital management, this study addresses these foundational matters but then emphasizes team effectiveness in hospital management interventions and research articles on management teams were reviewed to determine the methods used to study these teams, with the aim of developing an understanding that can serve as the base for research of team effectiveness in hospital management.

Defining team and team effectiveness

There are many typologies have identified different types of teams. Work teams, Parallel teams, Project teams, Management teams. The research in management teams define effectiveness as firm performance and use objective measures. The most common rated variables are return on equity[6, 7] return on assets[8, 9] sales growth[10, 11] total return to shareholders change in sales and change in profitability.[11] Nevertheless, other studies consider decision quality[12, 13] contribution to decision[14] Share information[6] and task performance.[15, 16]

Variables at the team-level of analysis and rated with subjective measures. Attitudinal outcomes are also taken into account for assessing effectiveness of management teams. Specifically, some of these variables are consensus understanding and commitment to the decision[16] And satisfaction. Few studies focus on behavioral outcomes, although turnover from both the team and the firm is studied the most.

There is general agreement that teams contain a small, manageable number of members, who have the right mix of skills and expertise, who are all committed to a meaningful purpose, with achievable performance goals for which they are collectively responsible[17]. Teams are an important part of the functioning of an organization. They can be significant contributors to the effectiveness of organizations or can cause problems and restrict organizational success [18]. Teams are defined as work groups that are charged with the fulfillment of a performance task that requires joint cooperation. This distinguishes them clearly from other groups, which might instead seek to attain individual learning results that are acquired in groups, or merely cultivate social and other forms of contacts [19]. Teams have become a basic building block in organizations [4, 20]. In this paper we are defining management teams.

The research in management teams define effectiveness as firm performance and use objective measures. The most common rated variables are return on equity, return on assets, sales growth, total return to shareholders, change in sales and change in profitability[3]. team members must integrate and synchronize strategies and activities to achieve the objections of the team [21]. To better understand team effectiveness, team performance is evaluated in terms of inter-team productivity and intra-team productivity. Team effectiveness is based on team performance, which is the extent to which the groups' productive output meets the approval of customers, interdependent functioning, which is the extent to which the team is interreliant on one another, and team satisfaction, which is the extent to which the team is satisfied with team membership[22]. Other categorized dimensions related to group member behavior in problem-solving situations as socio-emotional, task, and negative reactions[23].Team effectiveness can be evaluated by five broad principal variables: performance, behavior, attitude, team member style, and corporate culture[1]. The effectiveness of a health care team improves clinical outcomes, patient safety, the care environment for the patient and his or her family, and the work atmosphere and culture for practicing clinicians [24].

Origins of team effectiveness

There is broad consensus in the literature about the defining features of teams. Regular communication, coordination, distinctive roles, interdependent tasks and shared norms are important features. Most

commonly, teams are viewed as a three-stage system where they utilize resources (input), maintain internal processes (throughput) and produce specific products (output). Assuming this model, the necessary antecedent conditions (input) together with the processes (throughput) of maintaining teams define the characteristics of effective teams. Analysis of antecedent conditions and team processes often highlight issues for team development and training. In contrast, outcomes (output) are generally used to judge or evaluate team effectiveness [5]. Sources of team effectiveness in management were previously categorized in two types of models of team effectiveness can be distinguished. The first one is unidimensional and uses objective measures of team performance or of the degree of real productivity. The second one is multidimensional, since it supposes that team effectiveness depends on something else apart from performance or productivity .Several models have been developed under the multidimensional perspective. Thus, apart from performance, satisfaction was aggregated by Shiflett[25] and Gladstein[26] . Cummings [27] and Hackman [28] and colleagues considered satisfaction and commitment, Sundstrom[29] et al. clustered satisfaction and commitment in team viability. Finally, Cohen and Bailey categorized effectiveness into three major dimensions according to the team's impact:[30]

1. Performance effectiveness (productivity, efficiency);
2. Attitudinal outcomes (satisfaction, commitment and trust in management); and
3. Behavioral outcomes that included absenteeism, turnover or safety.[3]

Team effectiveness is defined as performance and employee satisfaction [26]. More explicitly, [31]defines it as the degree to which a group's output meets requirements in terms of quantity, quality, and timeliness (performance); the group experience improves its members' ability to work as a group in the future (behavior), and the group experience contributes to individual satisfaction (attitude). This definition makes team effectiveness a function of performance, attitude, and behavior. There are different models available in the literature to measure team effectiveness and each of them makes reference to specific and necessary characteristics for teams to become effective. Trying to identify the most relevant and common characteristics among these models, Adams et al.

Developed a framework to assist in the facilitation and measurement of effective teamwork[32]. In this model, seven constructs were identified as characteristics that need to be present during the team process for it to be effective. The seven constructs are productive conflict resolution, mature communication, accountable interdependence, clearly defined goals, common purpose, role clarity and psychological safety.

Adams et al. presented this functional relationship symbolically as: TE =f (p, b, a)

(Team effectiveness (TE) is a function of performance (P), behavior (B), and attitude (A).) Functional relationship can be expanded to include corporate culture (C):

$$TE = f(p, b, a, m, c)$$

Team effectiveness (TE) is a function of performance (P), behavior (B), attitude (A), team member style (M), and corporate culture (C).)

A simple alternative representation of this relationship is shown in figure 1.

Figure 1. Relationship of team effectiveness function

Team effectiveness in hospital management

Teams in health care organizations have a long, established tradition. However, despite health teams' potential contributions to diagnosis, problem solving, and patient well-being, experienced team practitioners have warned of the teams' fragility.

It is important to remember that teams have thin skins; there are not many forces holding them

together in relation to those potentially able to pull them apart. The forces that hold a team together are patient needs, institutional support, satisfaction with effective work, respect and friendship, and an understanding of the diagnostic process. Professional rivalries, misunderstanding the role of patient splitting, personal competitiveness, and lack of understanding of the collaborative problem solving process [33].

Hospitals have been offering health promotion in response to external social, political, and economic forces. These include community benefit laws, unsustainable health care spending, low rankings internationally for health status measures, decreasing workforce productivity, and desire for improved quality of life [34]. The tasks of hospital management can be described as pertaining to two large areas: quality management and allocation of resources [35]. Cooperation and communication has become even more important in health care, and teams can be seen at many levels in health care organizations, for example between professionals in primary health care and in special projects such as child protection. Inside and between departments in hospitals, communication and cooperation is necessary for the protection of both staff and patients, as regulation and public accountability becomes ever more unforgiving [36].

Literature review methodology

This review emphasized the team effectiveness in hospital management literatures given the central importance of the team effectiveness literature to this area and the author's home discipline of hospital management. Literature from social and organizational and interprofessional practice perspectives remain to be thoroughly considered.

Search methods for identification of studies

We searched the Ovid Resources and web of sciences ISI for related reviews and the following electronic databases for primary studies Ovid Resources:

- Journals Ovid Full Text December 30, 2011,
- EBM Reviews - Cochrane Central Register of Controlled Trials 4th Quarter 2011,
- EBM Reviews - Cochrane Database of Systematic Reviews 2005 to December 2011,
- EBM Reviews - Database of Abstracts of Reviews of Effects 4th Quarter 2011,
- Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1948 to Present,
- Ovid MEDLINE(R) Daily Update November 16, 2011
- ISI Web of Science (1975 to present)
- Search strategies for primary studies incorporate the methodological component of the OVID sources search strategy combined with selected index terms and free text terms. We translated the OVID search strategy into the other databases using the appropriate controlled vocabulary as applicable.

Full strategies for all databases are included in Appendix A.

Searching other resources

- We hand searched the Google scholar.
- We browsed the reference lists of all papers and relevant reviews identified.
- We e-mailed authors of other reviews in the field of effective qualified practice apropos relevant studies of which they may be conscious.

Search terms

The terms used for search purposes included, but were not limited to: search terms "team", ''team effectiveness'', ''hospital management'', "management", "administration". Exclusion/inclusion criteria due to the breadth of subjects covered, the literature review concentrates on research published from 2001 to 2011. The study excluded research published before 2001 and also excluded non-English language publications.

One hundred and eighty-one unique papers were referenced in the OVID resources, ISI web of sciences and googlscholar database. One hundred and sixty-six papers were dropped because they clearly fell outside the fundamental parameters of the literature review. Fifty papers to be considered it had to focus on team effectiveness. The 6 remaining papers were excluded because irrelevant setting Finally 8 paper include for this study. Figure 2, Appendix 1

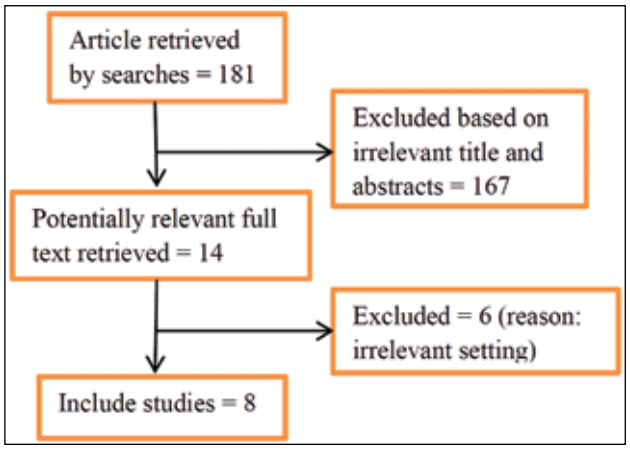

Figure 2. Diagram of team effectiveness study

Discussion

In the hospital environment, there is a greater need for both quality outputs and the judicious use of resources, and it is suggested that improved teamwork can help to achieve these aims. Work in hospitals requires people to collaborate in small groups and teams can be defined as effective work groups. Such collaboration is needed both for planning and managing the work (management groups) and for carrying out work tasks in hospital environments. Research suggests that working in teams can benefit for hospital organizations, but only if teams work with each other. This means that functional teams must communicate with each other and with outsiders. Additional, management and efficient teams need to comprehend and respect each other, if they are to cooperate with each other to achieve their goals. It is the task of management to plan resources for the future and the teamwork approach demands that this is done collaboratively and sensitively. Learning in organizations is not just about self- development, but requires an open and questioning attitude on the part of all concerned. Teams of managers and employees can also be set up to look at difficult organizational problems concerning, for example, quality, systems and processes. There are many examples in the literature of such teams who have not only solved work-based problems, but also gained deeper understandings in the process.

Conclusion

This paper has given an account of and the reasons for study team effectiveness in hospital management require observing management teams in their work environment. The main conclusion to be drawn from this study has shown how effective work groups have become more important in hospitals, as pressures grow to manage resources more effectively and complexity increases. The following conclusions can be drawn from the present study shows how the team working approach can help to manage resources, improve task performance, learning and communication. The illustrations quoted validate that it is possible to work efficiently in teams if those afraid are open-minded and motivated. Team approach to service delivery is not a managerial fad, nor an organizational ideal. The climate must first be set by management who need to establish a clear vision for the future and ensure that supervisory and operational staff clearly understands these goals. The creation of cross functional and management teams can help to cement relationships, create inter-team dialogue and solve difficult organizational problems such as hospitals. The evidence is that effective teamwork is not easily achieved but that it is worth striving for hospital management teams and Effective teams utilize health care services more efficiently. The results of this work can support future research on teams. Although considerable headway has been made in team effectiveness studies, there is still research to be done.

Acknowledgements

The authors gratefully acknowledge the financial support for this work that was provided by Tehran University of Medical Sciences.

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Appendix A

Literature Review Search Strategy

We searched the Ovid Resources: Journals@ Ovid Full Text December 30, 2011, EBM Reviews Cochrane Central Register of Controlled Trials 4th Quarter 2011, EBM Reviews - Cochrane Database of Systematic Reviews 2005 to December 2011, EBM Reviews - Database of Abstracts of Reviews of Effects 4th Quarter 2011, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1948 to Present, Ovid MEDLINE(R) Daily Update November 16, 2011, ISI Web of Science and googlescholar. Search terms were limited to publication dates ranging from 2001 to 2011 (inclusive). We also contacted manufacturers and researchers in the field. A summary of the database searches that were performed during the process of conducting the review is set out below.

Database Searches

Database Searched	Search Terms	Results
ISI Web of Science	team effectiveness + management	20
	team effectiveness + management + hospital	8
	Team + management + hospital	33
	hospital + administration + team	6
Journals@Ovid Full Text December 30, 2011,	Management + hospital	2
	Team effectiveness	4
	Management + effectiveness + hospital	3
	Management + Team + hospital	2
	Team effectiveness + Management	26
EBM Reviews - Cochrane Central Register of Controlled Trials 4th Quarter 2011,	Management + hospital	1
	Team effectiveness	-
	Management + effectiveness + hospital	2
	Management + Team + hospital	-
	Team effectiveness + Management	-
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1948 to Present,,	Management + hospital	8
	Team effectiveness	14
	Management + effectiveness + hospital	10
	Management + Team + hospital	9
	Team effectiveness + Management	32
Ovid MEDLINE(R) Daily Update November 16, 2011	Management + hospital	-
	Team effectiveness	1
	Management + effectiveness + hospital	-
	Management + Team + hospital	-
	Team effectiveness + Management	-
Total		181

The Effects of Physical Exercise on Reducing Body Weight and Body Composition of Obese Middle Aged People. A Systematic review

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Abstract

Aim The aim of this review paper was to determine the effects of physical exercise on reducing body weight and body composition of persons between 40 and 64 years of age on the basis of collected data and analyzed papers published between 1998 and 2010 year.

Methods Literature search was made using the following search bases: MEDLINE, Google Scholar, CINHAL, EMBASE, Kobson, DOAJ. Papers were selected based on several criteria. The reduction of body mass and body composition were particularly emphasized, that subjects were not suffering from other diseases except they were obese and that study only involves physical activity (exercise) and physical activity combined with diet during weight reduction of obese. In addition to the request that study included middle-aged people between 40 and 64 year and that they were over-weight (BMI> 25 kg/m2) or obese (BMI> 30 kg/m2), was the criteria that study was longitudinal.

Results The combination of exercise (either aerobic or resistance training) and diet has shown the best results in the reduction of body weight. Statistically significant differences ($p < 0.01$) was not found between continuous and interval work when the volume and intensity of exercise was equal.

Conclusion Moderate physical activity for middle aged people (40-64 year) in combination with reduced calorie intake has positive impact on body fat and body weight reduction.

Key words: adiposity, exercise, fat, body mass index, obesity

Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure (1). It was found that the inactivity is associated with many types of diseases such as hypertension, Diabetes mellitus type 2, osteoporosis, cardiovascular and respiratory diseases (2-4). The level of physical activity is often used as a parameter for monitoring and evaluation of public health and almost always associated with health status. This monitoring is especially important for those middle-aged (40-64) people for the prevention of many diseases, but also for the reducing of mortality rate. Obesity is considered one of the most important public health problems and according to evaluation the second most common cause of mortality that can be successfully prevented. It is believed that almost 30% of obese adults were obese in childhood. The main difference is that the obesity among these individuals is in much worse stage than among those who were not obese in childhood. In the last decades in most countries there is increase in prevalence of obesity in adulthood that have reached epidemic proportions in all industrialized countries (5).

There are many factors that may influence obesity, and the most important are: hereditary factors, social conditions, lifestyle, eating habits and physical activity level and environment factor. Parental obesity itself may have an impact on obesity of children through genetic factors and environmental factors within the family. The greatest risk for the developing of obesity in adulthood are the overweight parents and obesity in the period from three to ten years (6).

Parent obesity does not have too much influence in children after the tenth year of life because it is considered that after ten years the main cause of excessive obesity is an energy intake (7). Some of the research results on twins have confirm the predisposition of obesity as a factor of inheritance

with 50-70% (8). It can also be viewed body mass index (BMI) in children, which largely depends on the BMI of biological parents. If both parents are obese, about 80% of their children will be obese. In other case, if only one parent is obese the frequency decreases to 40%. Finally, if neither parent is obese the prevalence of obesity is only 14% (9). Obesity is a chronic disease characterized by increased fat depots. It can be characterized as increasing body fat mass to a degree that leads to damage the health and development of a series of complications (10). When the people of secondary age are included in the program of physical exercise it is very important to respect the recommendations regarding the intensity and frequency in order to avoid side effects. Recommendations for people between 40 and 60 years of age include physical activity of moderate intensity, 30 minutes and more 3-5 times a week, however more recent recommendations suggest everyday physical activity (11). The U.S. Surgeon General's Report recommends weekly physical activity in the volume of consumption of 1.000 kcal / week (or 150 kcal / day).

The most common variety of activities for this population are walking, gardening and house working (12). Although aerobic activities dominate, it is now recommended to use strength exercises to compensate the loss of muscle mass of the aging process and so reduce the risk of falls and injuries. The aim of this review paper was to determine the effects of physical exercise on reducing body weight and body composition of persons between 40 and 64 years of age on the basis of collected data and analyzed papers published between 1998 and 2010 year.

Methods

Literature search

Literature search was made using the following search bases: MEDLINE, Google Scholar, CINHAL, EMBASE, Kobson, DOAJ. For a more closely defined search we have limited only to works that are problem of this study and the following key words were used: effect, prevalence, obesity, physical activity, overweight, diet and adult. With advanced search of the literature only those papers that were published in the period from 1998 to 2010 were taken into consideration. In addition, references from all papers were reviewed to find additional scientific studies that explored the same or similar field.

The selection of works and data collection

Papers were selected based on several criteria of which the reduction of body mass and body composition were particularly emphasized as both represent the primary goal. Second requirement for the acceptance of the study was that subjects were not suffering from other diseases except they were obese, so that our research results would suggest a wrong conclusion about the impact of these other diseases compared only with those who were obese. The third requirement for the study selection was that study only involves physical activity (exercise) and physical activity combined with diet during weight reduction of obese. Since these are the physical effects of exercise on body weight reduction, the fourth requirement is that the study was longitudinal. In addition to the request that study included middle-aged people between 40 and 64 year, was the criteria that subjects were over-weight (BMI> 25 kg/m2) or obese (BMI> 30 kg/m2).

Theoretical approach to the problem

For the collection and review of the papers descriptive method along with the theoretical analysis was used. Study included 20 closely associated research papers with the effects of physical exercise on obesity which were carefully analyzed and also respond to all criteria for selection. In the initial literature search 345 references were identified, which respond to some of the research criteria. However, 325 were eliminated on the basis of selection and other criteria (Figure 1). Collected and analyzed papers are shown in Table 1. Each research is shown by the following parameters: the sample of subjects referred to the number of participants, age, sex, body mass and body mass index (BMI). Experimental treatment included the duration of exercise program, the number of groups, exercise program that has been applied in research, diet and the results of the study. The number of participants has quite varied from research to research so that the smallest number of participants were 22 in research Donnely, Jacobsen, Heelan, Seip, Smith, (13) and the largest number of participants was 130, in the research Layman, Evans,

Erickson, Seyler, Weber, Bagshaw et al. (14). Most of studies programs (17) included physical exercise and diet while only three were related only to physical exercise. When it comes to the sample characteristics, studies mostly included women or men and women combined, while only four studies included men (15-18). The shortest training program lasted 12 weeks in three studies (18-20) while the longest training period was 77 weeks (13,21). Most often training program duration was 48 weeks. The intensity of the exercise was mostly aerobic character with 50-80% of maximum heart rate. Frequency of exercise was often 3 or 5 times a week with quite variable range of activities, from 30 to 60 minutes. Daily caloric reduction ranged from 700-1700 kcal / day.

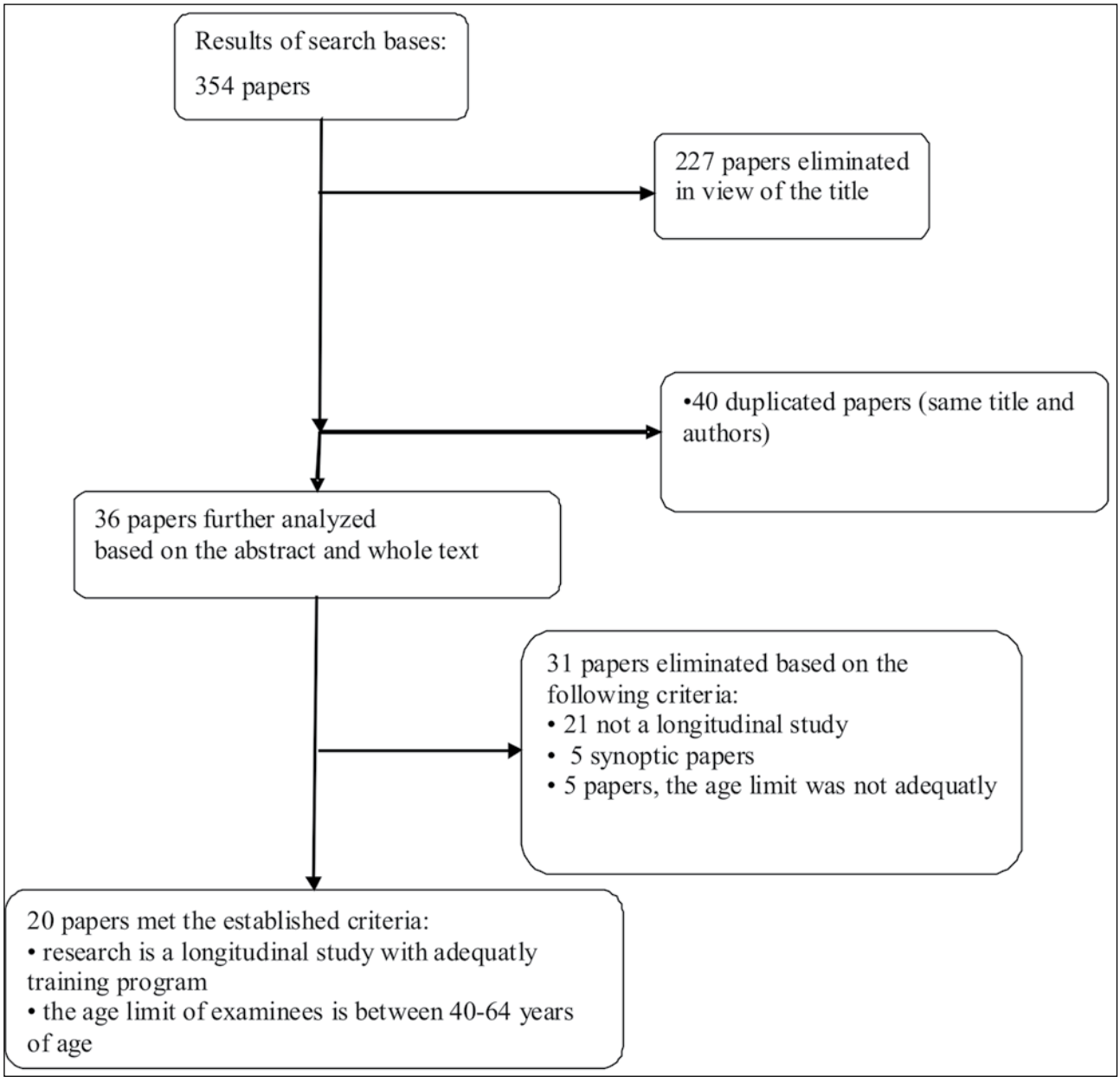

Figure 1. Flow of data retrieval procedure

Tabela 1. The effects of physical exercise on reducing body weight in obese people

First author, year	Participants					Experimental program			Results	
	Number of subjects	Mean age	sex	Body weight (kg)	BMI	Program duration	Number of groups	Exercise program	diet (kcal/ day)	
Kukonen-Harjula et al. 2005	90	42	M	95.3±6.6	33±2.6	24 weeks	a) walking b) resistance training c) control group	Three times per week for 45 min. a) 60-70% VO2max. b) 60-80% 1RM (8x3)		**Body mass (kg)** a) and b) mean -14.2 **BMI (kg/ m²)** -4.1 **Fat mass (kg)**
Fogelholm et al. 2000	82	40	F	80±9.8	34±3.6	12 weeks	a) 2-3h walking weekly b)4-6h walking weekly c) control group	a) 50% HRR b)60% HRR		**Body mass (kg)** a) -3.5±4.75 b) -2.6±11.35 c)+2.0±9.85 **BMI (kg/ m²)** **Fat mass (kg)** a)-2.3 b)-1.7 c) no change
Andersen et al. 1999	40	42.9±8.3	F	89.2±11.6	32.9±4.3	16 weeks	a)aerobic b) walking on stairs	a)fast walking 45 min. a day. 3 times per week b) 30 min. of growing activity separated into few parts	1200	**Body mass (kg)** a) - 8.3±3.8 b) – 7.9±4.2 **%BF (%)** a)-41.9 b)-45.5 **Fat mass (kg)** a)-7.4 b)-6.2 **FFM (kg)** a)-0.5 b)-1.4
Leermarkers et al. 1999	67	50.8±2.1	M+F	86.4±9.5	30.8±4.5	24 weeks	a)experimental b) experimental with diet c) control group	Individual walking for 30 min a day, 5 times a week	1200 woman 1500 man	**Body mass (kg)** a) - 8.5 b) - 9.0

Wadden et al. 1998	77	44.2±7.7	F	95.8±15.3	36.5±5.7	48 weeks	a) only diet b) diet and aerobic exercise c) diet and resistance training d) diet, resistance training and aerobic exercise	3 times a week intensity; 11-15 according to Borg scale (aerobic exercise); 11-14 x 2 sets (resistance training)	1200-1500	**Body mass (kg)**	a) -17.7±5.7 b) -15.8±6.8 c) -17.8±8.8 d) -18.6±7.3
Weinstock et al. 1998	45	43.3±1.1	F	96.9±2.2	35.9±0.9	48 weeks	a) only diet b) diet and aerobic exercise c) diet and resistance training	3 times a week 1-28 weeks and 2 times a week for 28-48 weeks; a)step aerobic for 12-40min progressively dosed b) 11 exercise bigger muscle groups, 10-14 repetitions	925	**Body mass (kg)**	Mean weight loss was 13.8, no statistical significarion between groups
Roseland et al. 2001	186	49.2±2.5	M		28.6±3.5	48 weeks	a) diet group b) training group c) diet and training group d) control group	Aerobic training, fast walking, jogging; 3 times a week for 60 min		**Body mass (kg)**	a) - 1.4 b) - 1 c) - 2.4 d) - 0.1
										BMI (kg/ m^2)	a)-1.3 b)-0.3 c)-1.8 d)0.3
										%BF (%)	a)-1.4 b)-1.0 c)-2.4 d)-0.1
										Fat mass (kg)	a)-1.2 b)-0.9 c)-1.1 d)0.05

Cox et al. 2003	59	42.4±5.0	M	96.3±13.9	31.1±3.9	16 weeks	a) i c) control and moderate exercise b) i d) intensive exercise(bicycle)	a) i c) ones or twice a week less than 30min b) i d) 3 times a week for 30 min	a) i b) without c) i d) 1200	**Body mass (kg)**	a) + 1 b) - 3.2 c) - 8.0 d) - 12.2
										%BF (%)	a) -1.5 b) -0.1 c) -15.6* d) -15.6*
Donnelly et al. 2000	22	51.5±8.5	F	83.6±9.42	31.2±3.8	77 weeks	a)continuing exercise b) exercise with rests through fast walking	a)3 times a week aerobic exercise for 30min. 60-75%max b)5 times a week for 15min., twice a day		**Body mass (kg)**	a) - 1.7±5.55 b) - 0.8±13.1
										BMI (kg/ m²)	a)-0.78 b)-0.20
										%BF (%)	a)-1.76 b)-0.54
										Fat mass (kg)	a)-2.11* b)-0.63
Layman et al. 2005	48	46.6±1.4	F	87.6±3.9	32.9±1.5	16 weeks	a)diet 1 b) diet + exercise c)diet 2 d) diet 2 + exercise	a)high protein diet b)moderate walking 5 times a week for 30min. + diet A c)low protein diet d) walking 5 times a week and resistance exercise 2 times a week + diet B	1700	**Body mass (kg)**	a) - 8.7±4.75 b) - 9.8±4.25 c) - 7.8±3.25 d) -6.7±2.75
										Lean mass (kg)	a) -2.0* b) -0.4 c) -2.7 d) -1.0*
										Fat mass (kg)	a) -5.9* b) -8.8* c) -5.0* d) -5.5*

Nieman et al. 2002	91	45.6±1.1	F	89.9±1.5	33.1±0.6	12 weeks	a) diet b)aerobic exercise c)diet and aerobic exercise d) control group	a)combination of stretching and diet, 4 time per week x45 min b)walking 5 times a week 25-45min c)diet + walking 5 times a week for 25-45minuta d)without diet only streching 4 times a week for 45 minuta	1200-1300	**Body mass (kg)**	a) -7.8±0.2 b) - 5.0±2.85 c) - 4.1±0.5 d) - 0.8±2.45
										BMI (kg/ m²)	a) -2.9* b) - 0.3 c) - 2.9* d) -0.3
										%BF (%)	a) -4.2* b) -1.0 c) -3.7* d) -1.1
Ross et al. 2000	52	44.6±1.2	F	97.5±10.9	31.3±2.0	12 weeks	a)diet group b)exercise with body weight reduction c) control group	a)only diet b) fast walking and moderate running on treadmill 80% Hrmax until 700kcal was spent	700	**Body mass (kg)**	a) - 7.4±0.9 b) - 7.6±0.6 c) no change
										BMI (kg/ m²)	a) -2.4* b) -2.4* c) no change
										Fat mass (kg)	a) -4.8 b) -6.1 c) no change
Layman et al. 2009	130 (58M) (72Ž)	45.2±1.2	M+ F	91.7±2.0	32.6±0.7	48 weeks	a)diet 1700 +exercise b)diet 3400 +exercise	Moderate walking 5 times per week. Overall 100min/ week without difference in groups	1700 for women 1900 for men	**Body mass (kg)**	a) - 8.2±0.5 b) - 7.0±0.5
										Lean mass (kg)	a) -2.4 b) -2.2
										Fat mass (kg)	a) -6.6* b) -4.9

Janssen et al. 2002	38	40.1±6.7	F	90.8±14.5	33.7±4.1	16 weeks	a)aerobic exercise +diet b) resistance training +diet c)diet only	a)aerobic exercise 5 times per week for 15-60 min in combination with diet b)resistance training 3 times per week + diet. Circle method (7 exercise; 8-12 times)	1000	**Body mass (kg)**	a) - 10.0±3.9 b) - 11.1±4.4 c) - 10.1±3.1
										BMI (kg/ m²)	a)-4.2* b)-3.9* c)-4.0
										Fat mass (kg)	a)-9.9* b)-8.6* c)-7.8
Hays et al. 2004	34	60.5±2.3	M+ F	89±5.8	30.8±1.5	14 weeks	a)high protein diet b) high protein diet + exercise c) control group	a) high protein diet b) 4 times per week bicycle ergometer 80%Hrmax. 45min+diet	1900	**Body mass (kg)**	a) - 3.2±1.2* b) - 4.8±0.9* c)-0.1±0.6
										BMI (kg/ m²)	a)-1.1* b)-1.5*
										%BF (%)	a)-2.2* b)-3.5* c)0.2
Ash et al. 2009	76	48±13	M+ F	90.3±10.1	34±5.5	48 weeks	a) diet group b) diet and exercise c) control group	a)regular diet b)moderate aerobic exercise	1500	**Body mass (kg)**	a) - 5.6 b) -7.8
Fogelholm et al. 1999	85	43±3.1	F	88.2±6.3	34	12 weeks	a)walking b) walking c) control group	a)walking 2-3h per week with reduction of 1000kcal b)walking 4-6h per week with reduction of 2000kcal	1000-2000	**Body mass (kg)**	a) -13±0.7 b) -12.6±0.7 c) -13.5±0.6
										Fat mass (kg)	a)-8.9 b)-8.6 c)-8.9

Jakicic et al. 1999	115	37.1±5.4	F	88.9±10.9	32.4±3.8	77 weeks	a)exercise (long distance) b) exercise (short distance) c)short distance + tredmil	a) 5 times per week for 20-40min b) 5 times per week 2-4 daily per 10 min c)5 times per week. 2-4 daily per 10 min	1200	**Body mass (kg)**	a) - 5.8±7.1 b) - 3.7±6.6 c) - 7.4±7.8
										BMI (kg/ m^2)	a)-2.1 b)-1.3 c)-2.7
										%BF (%)	a)-2.9 b)-1.6 c)-4.1
										Fat mass (kg)	a)-4.5 b)-2.7 c)-6.0
										Lean mass (kg)	a)-0.8 b)-0.7 c)-1.0
Jones et al. 1999	102	57±3.3	M+ F	97±5.6	34.3±1.7	36 weeks	a)diet with aerobic exercise b) control group	a)walking for 45 min 3 times per week b)control group	1500	**Body mass (kg)**	a) - 3.2±4.3* b) - 1.8±2.7*

*M-male; F-female;BMI- body mass index; 1RM- one repeat maximum; HRR- heart rate reserve; %BF-percentage of body fat; Hrmax-heart rate maximum *-statistical signification increase*

Results

The duration of exercise was different and ranged in a wide range so that the shortest program was 12 weeks in two studies (18,20), and the longest was 77 weeks, also in two studies (13,21). However, most studies lasted 48 weeks, and it could be considered as an optimal period in which physical exercise may be experiencing its results and effects on the reduction of body weight. Also this period is sufficient to establish the possible yo-yo effects of using diet or exercise. In longitudinal studies where the effects of physical exercise are determined, a huge problem is a dropout sample, with about 35% of the sample that haven't finished the program (13,19- 24)

Frequency, intensity and type of training program

Number of groups was different and ranged from at least two groups (19, 22), to 4 groups. The largest number of studies (12,15,18,25-28) was designed with two experimental groups and one control group. Exercise programs were mostly aerobic from low to moderate intensity in the form of walking or jogging in combination with different diets for reducing caloric intake. In several studies (15,26) apart for the use of regular exercise, strength training as a circular training method was added for the major muscle groups, with moderate intensity of 10-15 repetitions. Caloric intake has been quite variable so that it ranged from 700 kcal / day in the study Ross et al. (18) up to 1900 kcal / day in research Hays et al. (27). Research Layman et al. (14) had a special diet for men (1900 kcal / day) and especially for women (1700 kcal / day). Drastic differences have not been observed for the reduction of body weight using different low-protein diets (- 7.8 ± 3.5 kg) and high-protein diets (8.7 ± 4.75) regardless of what type of exercise was combined (23,29).

An average value of weight loss has quite varied. The best effect was achieved by training program of aerobic exercise and strength training in combination with reduced calorie intake where participants have lost an average of 18.6 ± 7.3 kg for 48 weeks (30). The same research has showed that three times a week aerobic exercise with intensity of 11-15 and according to Borg scale and 11-14 repetitions in two sets of strength training have led to reduction in body weight of 15.8 ± 6.8 and 17.8 ± 8.8 kg. Frequency of exercise was three (13,15-17,22,30) to five times a week (14,20,21,23,26,29) with 30-60 minutes per session.

Effects of physical exercise on reducing body weight of persons of different sexes.

The majority of experimental studies (13,19,2022,25,29,30) have included the problem of obesity among women more than men, although there are few studies (12,23,24,27,31) which were carried out in both men and women, but in these cases are usually more included women than men. One question clearly arises, whether women are more obese than men or are they really suitable target group? This review of research studies included only 11 women representing 55%, 5 studies (12,23,24,27,31) with mixed character as tested in parallel by both men and women, while only four (15-18) studies or 20% were those that tested the obesity in men. This situation could be explained by the fact that women are more prone to gain weight than men and thus they have more need for greater look so the authors were mostly involved in finding the most appropriate training program.

Discussion

Effects of physical exercise on reducing body weight

Obesity, more than any other disease is a result of change in lifestyle of modern man. These changes are primarily related to increased use of motorized transport and use of devices that reduce the physical strain of man and thus lead to sedentary lifestyle causing a hypokinesis, disease of our time. The biggest reason for this modern society state is physical inactivity (32). Many studies have shown that an active lifestyle and daily physical activity play an important role in the prevention of obesity (19,33). Isolated physical activity affects the reduction of body weight and body fat, but in combination with programmed reductive diet is an ideal formula for correct body composition (18,20,34). Also people who are physically active have bigger chance to maintain or reduce body weight for a longer period than those who only rely on a reduced diet. Some studies have shown that weight gain among participants was significantly reduced in the experimental

groups compared to controls after the exercise program (9,22,25,30). Significant body weight reduction which amounted over 10 kg has been recorded in one study, which had perhaps the most complex program where the participants were divided into four groups and the exercise involved diet, aerobic exercise and strength training with the load (25). The best result of this combined program was the combination of strength training and aerobic exercise training, where the strength training have increased muscle mass of the participants which would later represent energy consumers in aerobic activities and along with diet has influenced that the number of calories in the end would be much smaller than the number of consumed which directly affect weight loss. Monitoring the subject condition after the training period was one of the tasks of nearly all research papers to avoid the yo-yo effect and thereby reduce the importance of physical activity. The condition of the participants who have continued with some physical activity after the training period has showed that they have managed to maintain their weight values at the final testing (9,22,31).

Diet is a very important factor in reducing body weight in obese people but not the only one, because the word diet only means a way of food intake so that it actually represents only a slightly reduced energy intake. However the best results are in combination with physical activity because doing so it can increase and accelerate human metabolism which consumes more energy. In studies (14,23,27,29) in which was used two types of diets, it was clear that a high-protein diet had more impact than the low-protein diet where carbohydrate prevailed. Greater intake of protein and less carbohydrate during aerobic exercise lead to the use of fat as energy source and thus directly affects the reduction of subcutaneous adipose tissue (14,27). Dosed aerobic exercise without diet suggested in the study Weinstorck et al. (25), with duration of 30-50 minutes three times a week showed a statistically significant reduction of body weight but only after 20 weeks. Also, many studies have shown no statistically significant differences between dosing following exercise: 1) three times a week for 30 minutes; five times a week for 20 minutes (18), 2) three times a week for 60 minutes; five times a week for 30 minutes (22). Two studies (13,21) have examined the parallel effects of continuous and intermittent exercise to determine which workout method is more efficient. Study Donnelly et al. (13) was created with exercise three times a week for 30 minutes of continuous operation (group I) and five times a week of interval work divided into two sets of 15 minutes (group II), while in study Jakicic et al. (21) the training program was used with continuous exercise five times a week for 40 minutes (group I) and five times a week of interval work in four sets of 10 minutes (group II). The final result of these studies did not show statistically significant differences ($p<0.01$) between continuous and interval work when the volume of exercise was equal. This fact shows us that in this target group of people from 40-64 years of age, total volume of exercise was the most important regardless of the duration of individual sessions. This fact is necessary for designing the recreational exercise program in modern life style, where one has not enough time to devote to continuity exercise because of work.

Effects of exercise training on body composition

Showing the real picture of body composition is good for determining how an individual has decreased body weight due to the loss of subcutaneous adipose tissue. This loss represents a great risk for different types of diseases, so that only one centimeter increase in waist circumference (visceral obesity) increases the risk of cardiovascular disease by 10%. The best effect of reducing body fat while increasing muscle mass was observed in subjects in the study conducted by Andersen et al. (22) and Kukkonen-Harjula et al. (15). The x-rays has directly measured free fat mass and in these two studies it was significantly reduced. Also very important is the relationship between hip circumference and waist. Waist to hip ratio was significantly lower in patients who had training with load than those who had a light aerobic training in form of walking (15).

In the study Laymen et al. (14) there were no difference between groups in the quantity of reduced weight. However, if we look qualitatively we can see that the group with high protein intake and a low-carbohydrate intake significantly reduced the amount of fat compared to the group with the carbohydrate diet. Very similar results were observed in the study Hays et al. (27). This clearly

indicates that for weight loss it is not enough to determine the whole body weight loss but it is necessary to determine the percentage loss of body fat compared to muscle fat.

A statistically significant loss of abdominal, visceral and intramuscular adipose tissue, on the level of significance ($p<0.01$) followed by magnetic resonance imaging, has helped Janssen et al. (26) to determine differences between groups in the training program (aerobic and strength training) in combination with diet. The total amount of reduced fat was higher in the group that had a strength training and diet (24 ± 8%), a group of aerobic exercise and diet had 21 ± 10% compared with the group who had only a diet where there was a reduction of only 15 %. A particular problem was the fact that few studies have compared men and women according to the criteria of better results between them and who have lost more weight, which represents an aggravating factor in interpreting the results. Therefore, future research is needed to examine the degree of obesity and weight reduction after the exercise program for people of different gender as well as any barriers for exercise in relation to gender and professional orientation.

Conclusion

Obesity is a public health problem associated with many chronic diseases or acute illnesses such as heart desease, hypertension, diabetes, low back pain syndrome. All recommendations for weight loss and body composition change in obese middle-aged people aged 40-64 years are reduced to the proper balance of energy intake in which the number of consumed calories exceeds the number of entered. A very important link in this process is the modification of ways of life, which means that reducing daily calorie intake and increase physical activity with regular education, promotion and motivation of these people. Exercise programs vary according to intensity, frequency, type and duration of exercise. It is known that fats are the dominant source of energy for activities of low to moderate intensity (50% VO2max, 50-60% HRmax). A review of available literature is more than obvious that there is a dilemma to select the type of exercise for this target group because this are people who regularly have their professional obligation to work. The main dilemma is aerobic exercise versus resistance training. Available studies have shown that both types of exercise provide significant results in terms of weight reduction. However, based on the analyzed parameters, it is impossible to establish a qualitative assessment of body composition.

Aerobic exercise has impact on the reduction of fat body mass and improvement of cardio-respiratory functions of the body along with muscle hypertrophy. Due to the aging process degenerative changes in muscle tissue occurs (decreased muscle mass, the possibility of injuries and falls becomes more pronounced with this group of participants). Therefore, strength training is recommended because it maintains a suitable balance of muscle and reduces body weight without loss of non-fat body mass. Research has shown that the best results have been achieved with a combination of these two types of training for more effective work on the body and body systems in the elderly while they can fit into the daily work activities. Common forms of physical exercise for this target group are: jogging, aerobic cyclic activity, walking, housework and work in the garden, moderate strength training and low to moderate intensity activities. These activities can trigger larger number of people because they are less physically demanding and easier to fit into the daily routine of the individual. The World Health Organization has directed it's attention to the daily walking, for 30 minutes, which need not be carried out continuously, but can be divided into 2 or 3 sessions, which is equally effective. From the quantitative point of view, daily 20-minute walking will lead to a loss of about 5 kg of fat per year. Another very important aspect of training is related to the harmonious functioning of the cardiovascular, respiratory and central nervous system. In addition to the physical activity practice, field that was more studied is the combination of diet and exercise. From a review of available papers, we can conclude that the low calorie diet is sufficient if we want to achieve quantitative, eye visible results. However, the diet is the primary objective of metabolic improvement in contrast to the exercise that aims to improve health. The combination of exercise (either aerobic or resistance training) and diet has shown the best results in the reduction of body weight. These pro-

grams have reduced the body mass seven to nine times more than the programs that were designed only with exercise. Although diet alone gave positive results in the elimination of excess pounds, detailed review of these studies and the effects were short-timeless.

Acknowledgement

This research was carried out as part of the project financed by the Ministry of Science of the Republic of Serbia, entitled "Physical activity and the fitness component of the elderly" (number 179056), approved in 2010, and which is being carried out by the Faculty of Sports and Physical Education of the University of Nis.

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Use of complementary and alternative medicine in cardiovascular diseases: a comparative literature review

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Abstract

Background: The popularity of complementary and alternative medicine (CAM) has increased and has been used extensively in cardiovascular disease (CVD) patients. We aimed to determine prevalence, types of complementary and alternative medicine (CAM), interactions between CAM and medicine therapy in patients with cardiovascular disease (CVD).

Methods: A systematic literature review was performed for the 10-year period. "Complementary and alternative medicine", "cardiovascular disease", "hypertension", "herbal medicine", "drug interactions", "nonprescription medications" were used as key search terms.

Results: A total of 45 articles were located, six of them were national studies, and 39 of them were international literature. High prevalence use of CAM was 28.3% and 72.5% in national studies, and 9.2% and 80.9% in international studies. The patients commonly preferred biological-based treatments as CAM such as ginseng, garlic, echinacea, and ginkgo.

Conclusions: It is suggested that health professionals should conduct further research about CAM therapies in CVD and develop guidelines related to CAM. In order to identify the effects, orientate clinical results and safe use of CAM, randomized controlled studies, with adequate sample sizes in full-length and statistically powerful studies are required in CVD.

Key words: Cardiovascular Diseases, Complementary Therapies, Herbal Medicine, Nonprescription Drugs

Introduction

Complementary and alternative medicine (CAM) therapies are increasingly used around the world. The American National Institutes of Health, National Center for *Complementary and Alternative Medicine* description has been the most widely adopted in this field. According to this description, "complementary and alternative medicine is a broad health domain that encompasses all health services, methods, practices and their accompanying beliefs other than the health system which is politically predominant in a particular society or culture in a given historical period"[1].

The prevalence of CAM use in people with chronic disease has been reported as higher than that found within the normal population [2] and is common in patients with cardiovascular problems. When CAM use in cardiac patients in the United States is examined, the rate has been as high as 61% in patients with coronary artery disease and arteriosclerotic risks [3] and 69.4% in hypertensive adults of advanced age [4]. In a study performed on women over age of 65 in Turkey, the use of herbal therapy has been found as 48.3%; among patients with hypertension CAM use is 70% [5]. Biological-based therapies are commonly used in Turkey. While herbal therapies or herbal essences are more frequently used rather than CAM in Turkey, the reason that they are more popular might also be related to their greater availability and their reduced costs [6]. In central Anatolia in Turkey, tales are told about herbals and "healers" like Lokman Hekim who used herbal medicine to cure sick people.[7] Many people also make use of herbal therapies because of the belief that "natural" is "safe". Herbal medicine still serves as a source of hope for some illnesses where modern medicine fails to offer a cure [7]. There are many studies on the side effects, allergic reactions and toxic effects of herbal products [8-10]. It is important, therefore, that health professionals become acquainted with the effects of herbal products.

Aim

This comparative literature review was performed using national and international studies to determine the prevalence of use of CAM methods and types, and drug interactions with CAM in patients with cardiovascular problems.

Methods

Search strategy

This study was performed using an internet search of national and international publications by screening cases from October 2008 to May 2010 to determine the status of CAM use within patients with CVD.

In this study, key words used within the search were "complementary and alternative medicine", "cardiovascular diseases", "non-prescription treatments", "hypertension", "herbal treatments," and "drug interactions". The national and international literature from the last decade has been examined. The inclusion criteria of the investigation have been designated as comprising CVDs and CAM, written in English for international literature and written in Turkish and/or English for national literature. No limit was specified for research type. All kinds of investigations including qualitative, quantitative and mixed have been approved and included in the study. Medline, PubMed, Cochrane, Up-to-date, CINAHL, NCCAM, Ovid, ProQuest, Ebscohost, Blackwell-Synergy**,** Google, HEC National Thesis Center were used as the search engines. Printed books and journals have also been included into the research. In this study, 45 publications were reached and seven of these were in the Turkish literature (Table 1).

The research types and sampling size of the national studies examined are shown in Table 1 and have been mainly identified as descriptive (n=5), [11-15] with others determined as a case presentation [16] and a mixed investigation [17]. Although the research related to the last 10 years, the national studies seem to have been accumulated in the last two years.

When the 38 international research articles were distributed by research types, the descriptive-sectional researches (n=15) were most common [18-30], then systematic reviews (n=10) [3, 31-39], literature reviews (n=5) [40-44], and non-randomized experimental researches (n=6) [45-50]. There were only two randomized controlled studies (RCTs) among the analyzed studies [51-52]. In related international literature, the studies were found to be distributed mainly in last five-year period. These investigations have also been examined from the point of sampling size and presented in Table 1.

Results

The aim of this literature review was to analyze the status of CAM use among cardiovascular patients as reported in Turkish and international publications; a total of 45 publications were located.

The CAM Prevalence Studies

In Turkey, six prevalence studies were found and brief information about the studies are given in Table 2. As shown, the national prevalence studies indicate the regional results relating to CAM use in patients with CVD, but do not reflect the country. According to these results, the CAM use prevalence has been found between 28.3% and 72.5%. The CAM prevalence is higher in studies performed in Samsun (northern Turkey) (72.5% and 53.5%) than others [17]. Fifteen international prevalence studies about CAM use in patients with CVD were located. As shown in Table 2 these studies were mainly performed in the United States between 2002 and 2009. In international publications, the CAM use prevalence of patients with CVD is between 9.2% and 80.9% [18].

Although the biological-based treatments are reported to still be in the first place in international research, the body–mind treatments [4, 18, 20, 22, 26], the manipulative and body-based treatments, have been found to be used [22, 24, 25, 27, 29, 53]. There were only three studies where biological-based treatments have been used [28-30].

CAM Methods and Types Studies

In this section, brief information about the CAM type and methods and results of studies have been. Only one of the off-prevalence studies has been done in Turkey [16]. In this study, the effects of LIDA capsule on coronary artery disease have been evaluated in a case of a young woman with no risk factors for CVD [16].

One of the 13 studies performed internationally in 2005 was a systematic review about CAM use

Table 1. Distribution of National and International Studies Research Type and Sampling Size

Author Name, Year	Research Type	Sampling Size
National Studies		
Yılmaz et al. 2007	Descriptive	310
Toprak and Demir 2007	Descriptive	72
Çapraz and 2007	Mix (descriptive and semi-experimental)	7703 and 75
Adıbelli et al. 2008	Descriptive	215
Şentürk et al. 2008	Case Presentation	1
Kütmeç et al. 2008	Descriptive	187
Türk and Süner 2008	Descriptive	150
International Studies		
Vaes and Chyka 2000	Literature Review	-
Holm et al. 2001	Experimental – RCT	45
Yung et al. 2001	Experimental – Non-RCT	9
Ai and Bolling 2002	Descriptive – -Sectional	246
Wood et al. 2003	Descriptive – Cross-Sectional	107
Vivekananthan et al. 2003	Systematic Review – Meta-Analyses	7 RCT
Knekt et al. 2004	Systematic Review	9 cohort study
Miller et al. 2004	Literature Review	-
Wang et al. 2004	Systematic Review – Meta-Analyses	39 RCT
Chagan et al. 2005	Descriptive – Cross Sectional	198
Izzoa et al. 2005	Literature Review	43 case report and 8 experimental studies
Bıjlanı et al. 2005	Experimental – Non- RCT	98
Vogel et al. 2005	Literature Review	-
Woodward 2005	Literature Review	-
Pittler and Ernst 2005	Systematic Review – Meta-Analyses	7 Systematic Reviews – 3 RCT with meta analyses
Huntley et al. 2005	Systematic Review	36 clinical studies
Barraco et al. 2005	Descriptive – Cross-Sectional	223
Ciceroa et al. 2005	Experimental – Non-RCT	111
Reshef et al. 2005	Experimental – Non-RCT	12
Zick et al. 2005	Descriptive – Cross-Sectional	252
Yeh et al. 2006	Descriptive – Cross-Sectional	10.572
Buettner et al. 2006	Systematic Review	44
Artz et al. 2006	Descriptive – Cross-Sectional	1962
Kaushik et al. 2006	Experimental – Non-RCT	100
Saydah and Eberhardt 2006	Descriptive – Cross-Sectional	3451*
Bell et al. 2006	Descriptive – Cross-Sectional	5821
Decker et al. 2007	Descriptive – Cross-Sectional	596
Mukamal et al. 2007	Experimental – RCT	31
Buettner et al. 2007	Descriptive – Cross-Sectional	6671
Rosenfeldt et al. 2007	Systematic Review – Meta-Analyses	12 clinical experiments and 9 other researches
Corso et al. 2007	Descriptive – Cross-Sectional	153
Eslick et al. 2008	Systematic Review – Meta-Analyses	47
Gohar et al. 2008	Descriptive – Cross-Sectional	196
Leung et al. 2008	Descriptive – Cross-Sectional	661
Greenfield et al. 2008	Descriptive – Cross-Sectional	463
Seifert et al. 2008	Experimental – Non-RCT	20
Ried et al. 2008	Systematic Review – Meta-Analysis	11 RCT
Jepson et al. 2009	Systematic Review	1 RCT

** The number of test subjects with cardiovascular disease in the research.*

Table 2. The Methods and Prevalence of CAM in Turkey and International Publications

Author Name, Year	Location	Prevalence (%)	CAM Method
Turkey			
Toprak and Demir 2007	Afyon	26.4	Garlic, lemon, grapefruit
Çapraz et al. 2007	Samsun	53.3	Garlic
Yılmaz et al. 2007	Sivas	38.7	Phytotherapy
Adıbelli ve ark 2008	Samsun	72.5	Lemon
Kütmeç ve ark 2008	Mersin	28.3	Lemon, garlic, olive oil and thyme
Türk and Süner 2008	Gaziantep	59.4	Garlic – yoghurt with garlic, lemon-lemon juice
International			
Ai and Bolling 2002	United States	80.9	Manipulative and body-based treatments (exercise), Body-mind treatments (Relaxing therapies, Spiritual healing), Biological-based treatments (nutrition support products), Alternative and medical systems (homeopathic), Energy treatments (healing touch)
Wood et al. 2003	Canada	64	Biological-based treatments (multivitamins)
Barraco et al. 2005	United States	63	Body-mind treatments (Prayer), Manipulative and body-based treatments (exercise, chiropractic therapy spine massage, physical therapy), Biological-based treatments
Chagan et al. 2005	United States	47.5*	Biological-based treatments (vitamin C, multi vitamins, calcium, vitamin B complex, coenzyme Q10, glucosamine, magnesium, vitamin D)
Zick et al. 2005	United States	30*	Biological-based treatments (nutrition support products)
Artz et al. 2006	United States	48.1	Biological-based treatments (vitamin E, garlic, Omega 3, fish oil, folic acid, Coenzyme Q-10)
Yeh et al. 2006	United States	36	Biological-based treatments (garlic, ginseng, ginkgo biloba, Echinacea), Body-mind treatments
Bell et al. 2006	United States	69.5	Body-mind treatments (Prayer), Biological-based treatments (herbal treatments), Manipulative and body-based treatments (chiropractic care), Alternative and medical system (homeopathic)
Saydah and Eberhardt 2006	United States	32	Biological-based treatments, Body-mind treatments, Manipulative and body-based treatments
Decker et al. 2007	United States	19	Body-mind treatments (Relaxing therapies), Biological-based treatments (home-made drugs), Alternative and medical system (acupuncture), Body-mind treatments (biofeedback)
Corso et al. 2007	Italy	22	Biological-based treatments, Alternative and medical system (homeopathic)
Buettner et al. 2007	United States	61	Biological-based treatments (vitamin E, folic acid, niacin, fish-oil, ginseng)
Greenfield et al. 2008	England	9.2	Biological-based treatments (vitamins and diets), Manipulative and body-based treatments (exercise)
Leung et al. 2008	Canada	35.1	Body-mind treatments
Gohar et al. 2008	England	43.1	Biological-based treatments (fish-oil, multi-vitamins, garlic, vitamin C), Body-mind treatment (prayer, relaxing, aroma therapy), Manipulative and body-based treatments (massage, acupuncture, reflexology), Alternative and medical systems (Chinese medicine, homeopathic), Energy therapies

** Percentages have been calculated as average.*

of patients with peripheral artery disease [35]. In this review, evidence relating to diet products that contain garlic, ginkgo biloba, omega-3 fatty acids, Padma 28 and vitamin E have been studied. Ginkgo biloba and Padma 28 have been discovered to be effective in patients with intermittent claudication comparing to the placebo group [35].

In second study conducted in 2008 the effects of garlic on blood pressure were analyzed by evaluating 11 RCT and meta-analysis studies [36]. In patients with hypertension, it has been proved that garlic preparations were superior to placebo in reducing blood pressure [36].

In a pilot study that aimed to determine the antihyperlipidemic effects of red rice (*monascus purpureus*), an important decrease in levels of total cholesterol, low density lipoproptein (LDL) and triglyceride in patients with moderate hypercholesterolemia without any significant clinically toxic changes in liver and muscles was identified [46].

Reshef et al proved in their study that a mixture of citrus and grapefruit (which contained flavonoid in high proportions and its active ingredients were naringin and narirutin) could be effective in the treatment of stage 1 HT [48].

In order to define the benefits of fish oil on hyperlipidemia, Eslick et al used a systematic review and a meta-analysis of 47 studies [31]. In patients with hyperlipidemia, a daily dose of 3.25gm fish oil consumption has been shown to significantly decrease the level of triglyceride clinically, without causing a change in total cholesterol [31]. In their RCT pilot study, Mukamal et al found no consistent effects on biomarkers of cardiovascular risk following six months of black tea intake [52].

Seven RCT studies about preventing CVD by using vitamin E and ß carotenes were analyzed by Vivekananthan et al [38]. According to their study vitamin E had no positive effect on reducing cardiovascular mortality and it was not recommended for routine use [34]. Nine cohort studies performed by Knekt et al aimed to understand the effect of antioxidant vitamins on the risk of coronary heart disease, and the intake of additional vitamin C in high proportion has been found to reduce CVD risk [34].

In some studies of mind–body techniques of CAM, Kaushik et al analyzed the effects of mental relaxation and slow breathing on essential hypertension and proved that both mental relaxation and deep breathing had decreasing effects on systolic and diastolic blood pressure, heart rate and respiratory rate [47]. Similarly, Yung et al analyzed the effects of relaxing exercises in the treatment of hypertension, and showed that all relaxing techniques have been found to reduce blood pressure [50]. A study of the effects of rhythm therapy (eurhythmy therapy), one of the body–mind treatments on heartbeat variability, reported that rhythm therapy was helpful in correcting patients' heartbeat variability [49]. In a non-random, pre-test–post-test study the effects of a yoga-based complementary life style training program for diabetic patients and cardiovascular risk factors were evaluated by Bijlani et al [45]. The patients' blood samples taken on the first day of the course were compared with those taken on the last day; in the last day serum total cholesterol, LDL and total triglyceride levels of patients were identified to have reduced and HDL levels increased significantly [45].

Discussion

Individuals with CVD commonly use CAM methods for the purpose of both prevention and treatment. However, the evidence indicates that CAM may help the conventional management of CVD collaterally, but do not support its primary treatment. It is also indicated that some of the CAM methods have the potential to interact with widely prescribed drugs and may have negative effects [54].

According to the literature, some of the herbs or herbal products reported to be used may cause difficulties in control of blood pressure or platelet functions in patients by interaction with the anti-platelet and/or antihypertensive drugs. For example, garlic (*allium sativum*), which has been used as a food and spice for many years all over the world, is able to affect plasma lipids, fibrinolytic activity, platelet aggregation, blood pressure and blood glucose [43]. Like garlic, ginkgo/ginkgo biloba, which was consumed for the purpose of increasing the microcirculation blood supply, could decrease the platelet level. Vitamin E, which was consumed as an antioxidant, can increase the bleeding risk by inhibiting platelet aggregation, increasing the effects of warfarin and decreasing the effects of statins [38]. In a similar vein, Cur-

cuma (*Curcuma longa*) have been consumed as an anti-platelet agent and causes bleeding by increasing the effect of anticoagulant drugs [43].

Warfarin and vitamin K work at antagonists so that plants containing vitamin K (e.g. green tea, raw parsley) may antagonize the anticoagulant effects of warfarin [40]. In one case, the patient who takes a constant dose of warfarin and ginseng therapy has demonstrated a reduced INR (international normalized ratio) level [54]. Ginseng/ Panax Ginseng was consumed for its different actions as an immunomodulator, anti-inflammatory, antitumor, and hypoglycemic. At the same time it reduces the anticoagulation effect of warfarin; decrease the level of INR; decreases the blood pressure and blood glucose; and increases the lipid profiles of the patient [37]. It shows positive inotropic effects by reducing the systolic and diastolic pressures in hypertensive patients and reduces the warfarin response by providing pro-coagulant effect. Health care personnel should supervise the prothrombin time and INR level more carefully in patients who desire to consume this product [43].

Herbal teas (e.g. green tea) have been consumed in order to help weight loss, cause laxative and diuretic effects and perspiration. It is also known that herbal teas have some unwanted effects from uncontrolled use or excessive intake by causing hypokalemia. In contrast to the anticoagulant effects of garlic, ginkgo or vitamin E, herbal teas such as green tea may antagonize the anticoagulant effects of warfarin because of its vitamin K ingredient. Bradycardia, heart block, "torsades de pointes" syndrome, ventricular fibrillation and heart failure may evolve depending on potassium deficiency [55]. The green tea is a product frequently used in Eastern countries and the United States. Green tea is a product that has been presented as an efficacious plant for health in recent years in Turkey. According to scientific research results, consuming 5–7 cups of fresh green or black tea (approximately 800–1120 mL) per day is recommended [56]. Another plant that has adverse effects on heart rate, rhythm and vascular system is Echinacea [57]. It has been consumed as an immunostimulant, local anesthetic and anti-inflammatory since ancient times. Echinacea is available in extracts, tinctures, tablets, capsules, and ointments. It is also available in combination with other immune boosting herbs, vitamins, and minerals [58,59].

From the research studies we accessed there was a consensus that the vitamin C group do not have cardiovascular benefits, except grapefruit [60]. Grapefruit has been proved to have a healing effect on reducing diastolic blood pressure in the treatment of stage-1 hypertension [48] so patients should be informed about the benefits of grapefruit on their CAD treatment. Especially in the Mediterranean countries like Turkey, Italy or Spain grapefruit could be an available and economical CAM option for stage-1 hypertension patients.

Thyme is a naturally grown up herb all over Turkey and is commonly used in different ways, such as drinking it as thyme juice. Thyme juice is derived from the volatile oil of the thyme plant and used to reduce blood sugar and cholesterol levels [62]. Thyme oil can also be applied on the skin for the purpose of decreasing pain. No data about negative or positive effects of the thyme plant on cholesterol levels of the patients or its drug interactions could be found in the studies reviewed. Regarding other herbs, parsley is a naturally grown herb all over the Turkey and has been consumed as a diuretic. Parsley also appears to increase diuresis by inhibiting the Na+/K+-ATPase pump in the kidney, thereby enhancing sodium and water excretion while increasing potassium reabsorption. It is also known that it has some unwanted effects when use in excess by causing hypotension and increasing the effect of antihypertensives and toxicity of MAO inhibitors [63].

Fatty acids (Omega-3, Omega-6) effect eicosanoid products (e.g. thromboxanes, prostaglandins) that are responsible for coagulation, inflammation and vasoregulation. A balanced intake of Omega-3 and Omega-6 fatty acids (1 gram Omega-3 fatty acid for every 5-10 grams Omega-6 fatty acids) has an important role on the control of blood cholesterol and coagulation.[64] False the effects of Omega-3 fatty acids on CVD are as follows: decreases the levels of triglyceride, fibrinogen and thrombosis; reduces blood pressure; decreases cell proliferation; increases endothelial functions and arterial compliance. Fish-oil preparations and fish are important sources of Omega-3 and Omega-6 so CAD patients' use of fish oil and consuming fish as a source of fatty acids may be supported by

the health care personnel. From our observations, Turkish people consume fish oil for the purpose of strengthening their bodies, especially their bones. They could also be advised about consuming fish or Fish-oil drugs and the other Omega-3, Omega-6 from sources such as vegetables with dark green leaves, flax seed, sunflower seed and walnuts for the control of their blood cholesterol and coagulation [64].

Padma 28, which is a mixture of a variety of different herbs, originated from traditional Tibetan medicine and has been used since the 1960s in Europe for the symptomatic treatment of circulatory disorders. Intermittent claudication, a symptoms cluster in peripheral vascular disorders, that includes occurrence of pain, ache, cramps or a sense of fatigue due to inadequate blood supply and leading to an inability to walk. In a meta-analysis by Melzer and others it was found that Padma 28 increased the walking distance in these patients by >100 m and thus it could be beneficial for those with peripheral arterial occlusive diseases along with exercise [65]. On the other hand; Padma 28 also caused a significant inhibition of inducible nitric oxide synthesis in tests utilizing a mouse macrophage cell line. In humans, inducible nitric oxide synthesis is associated with infectious and inflammatory disease processes and is responsible for the vasodilatation and hypotension observed in cases of septic shock [66]. In Turkey, the usage of Padma 28 is not common and the products that provide fast weight loss and increase physical performance can be sold illegally. Şentürk et al's case study manifests the requirement of public awareness regarding use of these products, such as LIDA and points out that health staff have important responsibilities in this regard [16].

As indicated above, there are several positive and negative effects of biological-based treatments. The contents and effects of most herbal products are not known exactly and in what amount and frequency individuals administer the active ingredient cannot be determined. In addition, sufficient information regarding effects of many herbal drugs concerning for acute and chronic toxicities, standardization, stability and qualities do not exist [60]. The use of herbal products may also lead to undesirable effects that cannot be anticipated, depending on genetic susceptibility and an individual's sensitivity. Due to the individual effects of biological-based treatments, the evaluation of the patient with regard of CAM use should be included in the patient evaluation forms [66]. Unless evidence-based data exist, biological-based treatments are thought to be inappropriate for patients, and they should be informed by health staff not to use these products. Providing correct and appropriate suggestions to the patients about known benefits and possibilities of plant–drug interactions is a responsibility for health care suppliers.

Because drug–herbal interactions are not placed in user's manuals, health personnel's unawareness of the patient's herbal product use, and lack of sufficient relevant information, the possibility of unwanted significant adverse effects increase in some persons that using CAM methods. Examination of herbal products, as well as synthetic drugs, through clinical studies during their standardizations, considering the features such as use locations, dosage, possible interactions, and possible adverse effects and packaging, will increase the safe and effective use of these products [58].

Conclusion

The interaction between herbal products and cardiovascular drugs is a crucial patient safety issue. Patients concomitantly using CAM with cardiovascular pharmacotherapy are under great risks in terms of unwanted adverse effects. Health care professionals must have knowledge about CAM use and methods, potential risks of methods used, and plant–drug interactions, and must evaluate the patient using an unprejudiced approach and supply an appropriate consultancy.

Acknowledgments

This study is supported by Management Unit of Scientific Research Projects of Akdeniz University.

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The Development of Physical Medicine and Rehabilitation in Vojvodina

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Abstract

The development of physical medicine and rehabilitation in Vojvodina closley followed the development of the same branch of medicine in Serbia. Today, the three main institutions and leaders in the field of rehabilitation in Vojvodina are: Medical Rehabilitation Clinic of the Clinical Center of Vojvodina, Special Hospital for Rheumatic Diseases Iodine Spa and the Pediatric Habilitation and Rehabilitation Clinic of the Child and Adolescent Health Care Institute of Vojvodina.

The first institution for physical therapy in Vojvodina was the Iodine Spa, founded in 1911. Today, the Iodine Spa is known as the Special Hospital for Rheumatic Diseases, and it primarily provides prevention, diagnosis, treatment and rehabilitation of rheumatic patients in outpatient and hospital settings.

The Department of Physical Medicine and Rehabilitation of the General Hospital in Novi Sad was founded in 1959. The most common disabilities treated at the Medical Rehabilitation Clinic include: hemiplegia after cerebrovascular accidents, paraplegia due to spinal lesions, conditions after limb amputation, peripheral nerve palsy, severe consequences of traumatism and traumatism in the elderly.

The Department of Pediatric Rehabilitation, first and foremost in Vojvodina, was founded in 1968, at the Mother and Child Health Care Institute. It is specialized for habilitation, rehabilitation, physical diagnosis and therapy of children with hereditary diseases, congenital diseases and deformities, acquired diseases and after trauma and polytrauma.

The major goals of medical rehabilitation in Vojvodina are to integrate disabled people into their living and working environment through multidisciplinary approaches, using all the procedures of current medical rehabilitation.

Key words: Physical Medicine, Rehabilitation Centers, Child Health Services, Hystory of Medicine

Introduction

The history of physical medicine and rehabilitation in Serbia begins with the ancient Roman period. The Romans are credited with establishing balneotherapy and use of hot springs, as they built baths and resting places for their troops. Today, there are more than 300 thermal springs in Serbia, and many of those are located in Vojvodina. The first Spa Clinic in Serbia was founded in 1868 in Vrnjačka Spa.

The need for medical rehabilitation in Serbia arose after the First World War due to the large number of disabled persons, so in 1919 Orthopedic Institute was founded in Belgrade. The first Department of Physical Therapy was founded in 1930, in the General Military Hospital in Belgrade. Further activities associated with the integration of physically disabled persons into the society were taken after the Second World War. This contributed to further development of medical rehabilitation in Serbia. Thus, in 1953, the Institute of Physical Medicine and Rehabilitation of Serbia was founded in Belgrade after the Rusk's model in New York.

The development of physical medicine and rehabilitation in Vojvodina closley followed the development of the same branch of medicine in Serbia and its capital, Belgrade. The three main institutions and leaders in the field of physical medicine and rehabilitation in Vojvodina are: the Medical Rehabilitation Clinic of the Clinical Center of Vojvodina, the Special Hospital for Rheumatic Diseases Iodine Spa and the Pediatric Habilitation and Rehabilitation Clinic of the Child and Adolescent Health Care Institute of Vojvodina (1).

The history of the Special Hospital for Rheumatic Diseases Iodine Spa

The first institution for physical therapy in Vojvodina was Iodine Spa founded in 1911. The Spa was built owing to the discovery of a spring of mineral water, around 193 meters under the ground.

Chemical analysis of this mineral water was done by Ignjac Pfeiffer in 1907, and in 1914 Professor Vilmos Hanko determined the properties of this mineral water as muriatic, alkaline iodine water, 24 °C, ie. a hypothermic radioactive water.

Indications for Iodine Spa treatment in the early 20th century included: pains of rheumatic origin, neuralgia, sciatica, joint pain of rheumatic and traumatic origin, arthritis, obesity, sexually transmitted diseases, arteriosclerosis and so on. The Iodine Spa has registered more than 15.000 visitors a year, and had a permanent spa physician employed. Due to its great popularity till 1963, the Iodine Spa was a joint accommodation and healthcare institution. In 1963, the Iodine Spa became a health facility with 65 hospital beds and three specialized clinics: Rheumatology Clinic, Physical Medicine and Rehabilitation Clinic, and Orthopaedics and Traumatology Clinic.

In 1977, the Special Hospital for Rheumatic Diseases Iodine Spa was integrated with the Faculty of Medicine in Novi Sad and became a teaching hospital. In the mid eighties, the Spa kept only its name, while its facilities developed into a modern rheumatology institution. Due to its historical, cultural and artistic value, the Iodine Spa complex was declared a monument of culture in 1986.

In the early nineties, the inpatient capacity of Iodine Spa was expanded to a total of 102 beds. Reorganization of the Outpatient Clinics was made, so four outpatient specialized clinics were founded: the Rheumatic Diseases Clinic, the Infiltration Treatment Clinic, the Acupuncture Clinic, and the Clinic for Manual Medicine.

In 2006, the Iodine Spa became a Special Hospital for Rheumatic Diseases, with a capacity of 70 beds. The priority of this reorganized Special Hospital was to provide prevention, diagnosis, treatment and rehabilitation of rheumatic patients in outpatient and hospital settings (2).

The history of the Medical Rehabilitation Clinic

The Department of Physical Medicine and Rehabilitation of the General Hospital in Novi Sad was founded in 1959, in a building that was especially built for that purpose in 1958. This rehabilitation facility was the first of its kind in the Province of Vojvodina.

The department started working in very unfavorable conditions, with only five qualified health workers: a specialist and four physiotherapists. Professionally qualified staff was scarse. Therefore, intensive professional training and specialization of the staff was undertaken.

As the need for medical rehabilitation has increased significantly, the Department of Physical Medicine and Rehabilitation was established as an independent health facility in 1963, by the decree of the Executive Council of AP Vojvodina and became a Physical Medicine and Rehabilitation Institute. In 1962, the Institute became a teaching hospital of the Faculty of Medicine in Novi Sad.

The Institute had a capacity of 100 hospital beds for adults with physical disability, who required medical rehabilitation. At the same time, the outpatient department was developed, led by an Outpatient Clinic and a Cabinet for Prosthetics and Orthotics. The Institute was equipped with facilities for kinesitherapy, electrotherapy, hydrotherapy and occupational therapy. It also acquired all the necessary equipment for training disabled individuals through medical rehabilitation, as well as modern diagnostic tools such as two-channel electromyography (3).

The Institute provided medical rehabilitation for physically disabled adults, regardless of the cause and severity of the disability. The most numerous were patients with trauma, patients with hemiplegia, paraplegia (quadriplegia), patients after limb amputation, peripheral paralysis, rheumatic diseases and other conditions.

In the eighties, scientific research focused on disabled person and their rehabilitation, with special emphasis on rheumatic diseases as the cause of disability. Special interest was paid to the lumbar and cervical syndromes. Estimation of damaged functions was performed, as well as of the remaining functional and working ability and with vocational guidance of patients.

In 1997, the Medical Rehabilitation Institute became an integral part of the Clinical Center of Vojvodina. Today, Medical Rehabilitation Clinic implements contemporary methods of evaluation and medical rehabilitation of disabled persons. Prevention of disability and secondary complications in patients who are undergoing treatment on other clinics is conducted by the early rehabilitation team. The basic principle is teamwork. Rehabilitation te-

ams consist of experts of all those profiles that are necessary for solving complex physical, psychological and social repercussions of disability.

The most common disabilities treated at the Medical Rehabilitation Clinic today are: hemiplegia after cerebrovascular accident, paraplegia due to spinal lesions, conditions after limb ampultation, peripheral nerve palsy, severe consequences of traumatism and traumatism in the elderly. It also provides physical treatment for patients with lumbar and cervical syndromes and other painful syndromes related to degenerative diseases of the musculoskeletal system.

Today, the Clinic has 120 beds, in four departments. The outpatients visit three departments: Acupuncture Department, Orthotics and Prosthetics Department, the Electrodiagnosis Department, and the Follow-up Department of disabled patients after discharge. The premeses for physical therapy include 5 halls for kinesiotherapy, 3 rooms for electrotherapy and thermotherapy, a room for occupational therapy and a hydrotherapy area with a swimming pool.

Scientific research in the field of physical medicine and rehabilitation is regularly conducted through meetings, professional training, and specializations. If conferences of national importance are held at the Clinic, all participants publish their papers, but they also actively participate in international scientific conferences abroad. Physicians employed at the Clinic are members of expert associations in the country and abroad. The Department is conducting research in various research projects (4).

The History of Pediatric Rehabilitation in Novi Sad

The Department of Pediatric Rehabilitation, the first and foremost in Vojvodina, was founded in 1968, at the Mother and Child Health Care Institute. The Department was primarily responsible for the treatment of children with cerebral disseases from Novi Sad, who previously sought treatment in Belgrade.

The Department was originally located on the ground floor of the unfinished building for pediatric surgery, and had 30 beds. In 1972, it was moved to inadequate premises, the basement in the new wing of the Pediatric Institute, where it remained for the following 35 years.

Together with specialists in pediatric neuropsychiatry, specialists in pediatric rehabilitation founded the so-called *Novi Sad School,* which focused on the problems of the developmental age in children. Collaboration was also established with the pediatric orthopedists in the field of congenital and acquired defects and deformities. Consultations with colleagues from Belgrade, Zagreb and Ljubljana proved to be very useful as well. New knowledge, gained from international courses and seminars, has been applied in practice: therapeutic methods according to Tardieu, Bobath, Kabat, Vojta, application of Scolifes, FEPA, laser therapy and acupuncture.

A few years later, A Rehabilitation Institute for Children and Youth *Principovac* was founded 50 km away from Novi Sad. It was intended to accommodate children who needed prolonged treatment, and it provided regular and special education. The Institute had three departments: neuropsychiatry, pediatrics and rehabilitation. At the beginning, both the Department for Child Rehabilitation in Novi Sad and *Principovac* were understaffed: with a specialist physician, three physiotherapists, one occupational therapist, a speech therapist, a psychologist, a teacher and several nurses. With the increasing number of patients and introduction of new therapeutic procedures, the number of employees has increased as well.

The Pediatric Habilitation and Rehabilitation Center was founded in 2003, by merging the Department of Pediatric Rehabilitation and the Rehabilitation Institute for Children and Youth *Principovac*. The Center was officially opened in a new building in 2007. It is an integral part of the Child and Adolescenth Health Care Institute of Vojvodina. The building was built according to current standards, it has two floors, and a total area of 1000 m^2.

Today, the Pediatric Habilitation and Rehabilitation Clinic consists of two parts: the Outpatient Clinic includes the Admission Ward, the Specialized Examination Ward, Children Neurology Department and the Department for EMG Diagnostics and a Daily Hospital. The Inpatient Clinic includes the Department of Physical Medicine and Rehabilitation with the Ward for habilitation of infants and children with high-risk development, the Ward for rehabilitation of neurological and surgical patients, and the Department of Physical Medicine. Presently, the Clinic has 43 beds.

The Clinic is specialized in habilitation, rehabilitation, physical diagnosis and therapy of children with hereditary diseases, congenital diseases and deformities, acquired diseases and conditions after trauma and polytrauma.

Pediatric Rehabilitation was incorporated into the subject of Physical Medicine and Rehabilitation at the Faculty of Medicine in Novi Sad in 1980, and the Department became a teaching hospital for undergraduate medical students, graduate students, residents, general practitioners and other medical school students. Scientific activities in the field of Pediatric Rehabilitation take place within research projects, professional and scientific papers, publications, meetings, congresses, conferences, professional trainings and study sections (5).

The main goal of Medical Rehabilitation in Vojvodina today is to help disabled persons successful integration into their living and working environment, through multidisciplinary approaches, using all available sources of medical rehabilitation.

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Pregnancy and delivery after the breast carcinoma: is it possible?

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Abstract

The breast cancer is the most frequent tumor in the female population. In regard to the trend of increasing morbidity and high mortality rate as well as median of the disease and the age of 45 and below 45 years, this malignancy proved to be serious health problem. As far as the patients with this problem are in 50% in generative period of life, the patients with promising prognostic parameters and disease-free intervals of more than 5 years (particularly in case of negative hormone receptors) who wish to get pregnant could be allowed pregnancy with special precautions. The planned pregnancy in patients treated for breast cancer was earlier inconceivable for oncologists and gynecologists. The pregnancy in patient after operation and treatment of breast cancer is a height risk pregnancy and need to be control from gynecologist-perinatologist, as well as intensive control from oncologist. In standard multidisciplinary team presents of psychologist is necessary. Our study presented a case of pregnancy and delivery after patient of 25 years old had been operated and irradiated for medullary breast cancer and disease-free intervals more than 5 years. After bearing normal pregnancy, the patient deliver healthy female baby.

Key words: Breast Neoplasms; Carcinoma Medullary; Pregnancy; Delivery

Introduction

Breast cancer is the most frequent present tumor in the female population. After cervical cancer, breast cancer is the second most common pregnancy-associated malignancy (1). Breast cancer is relatively rare in young women, more than three-quarters of cases occur in women over age 50. In 2003 the American Cancer Society estimates that about 11500 US women under age 40 will develop invasive breast cancer and 1400 will die from it (2). Women, nowadays, delay their childbirth to the 30ies (3). Breast cancer and pregnancy are events that have an enormous impact on the lives of young women. When these events are associated they become issue with possible devastating consequences (4, 5). In regard to the trend of increasing morbidity and high mortality rate as well as median of the disease and the age of 45 and below 45 years, this malignancy proved to be serious health problem. As far as the patients with this problem are in 50% in generative period of life, the patients with promising prognostic parameters and disease-free intervals of more than 5 years (particularly in case of negative hormone receptors) who wish to get pregnant could be allowed pregnancy with special precautions (5). As improved treatments help more young women survive breast cancer, the question of whether to have a child later becomes increasingly important (6).

Pregnancy-associated breast cancer (PABC) is defined as breast cancer diagnosed during pregnancy or within the first year after delivery (7). Up to 1/3000 live births are complicated by breast cancer each year (1). Given the aging of the pregnant population, and the known relationship between late parity, age and breast cancer, rates of PABC may be expected to rise in the coming years (8). In the future, therefore, more breast cancer patients will have recently given birth, been pregnant concurrent with their diagnosis, or not yet started their childbearing at the time of their diagnosis (9).

Case report

Twenty-five years old women was admitted at the Institute of Oncology in Sremska Kamenica with palpable and movable tumefaction in the left breast. Physical examination confirmed the presence of tumefaction, which was located in upper lateral quadrant of the left breast towards the axilla (Spenser's lobe) (figure 1). The tumefaction was 1

cm in size, movable, well defined and of hard consistency. Laboratory findings, chest X ray, ECG and heart condition were in normal ranges. Upon the further questioning, menarche occurred at the age of thirteen, menstrual cycle was regular. The patient denied use contraceptive pills. No birth and 3 abortions are mentioned. The patient was smoker since the age of seventeenth. There were no inherited diseases or family history of cancer.

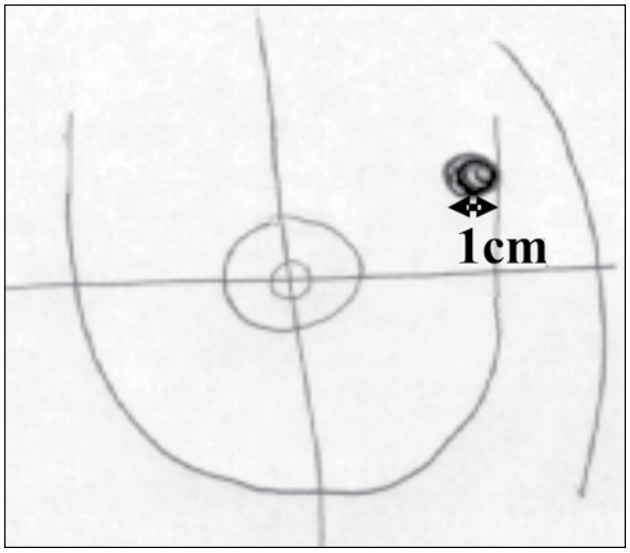


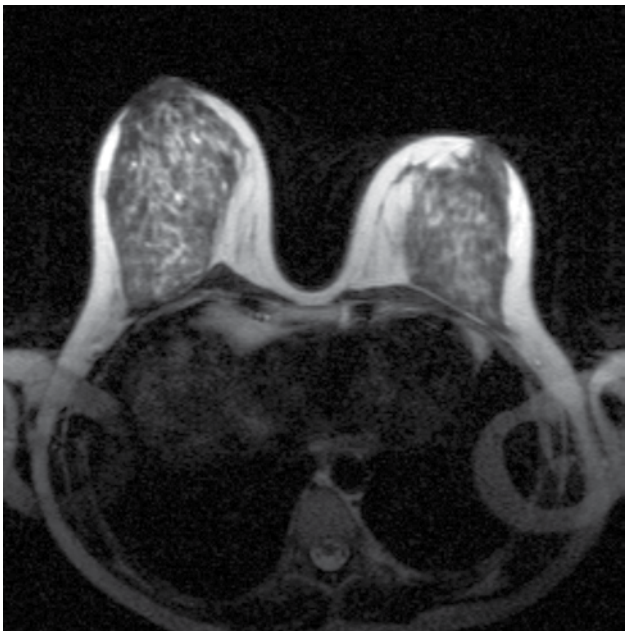
Figure 1. Localization of the tumor

The patient was operated on April 23, 1996 (figure 2). We performed biopsy extempore followed by quadrantectomy of the left breast with evacuation of axilla sec. Veronesi (because the extempore analysis confirmed carcinoma of the left breast). Primary tumor (size, 0,6 x 0,6 cm) was completely removed.

Figure 2. Patient's breast after operation

Histopathology analysis confirmed invasive breast cancer with dominant medullary component. The tumor was positive to ER and negative to PR receptors after operation the patient received irradiation therapy (50 Gy in 20 fractions and boost dose in tumor bed). The patient came for a regular control every third month for the first 3 years. Afterwards, she was checked up every 6 months according to the standard protocol: ultrasound of the liver every 6 months, scintigraphy of the skeleton once a year, and chest X ray. MRI of both breasts was preformed before the planned pregnancy (Figure 3).At her personal insistence and responsibility, the patient got pregnant spontaneously at the age of 31 (5 years after operation of primary breast carcinoma). The last menstruation was on December 31, 2001. During her pregnancy she came for regular controls. Ultrasonographic examination was performed 3 times: at 12, 20 and 28 gestational weeks, and oncology examination in the 1st and 3rd trimester of pregnancy (ultrasound of the liver, laboratory analyses and CA 15.3). There was no need for early amniocentesis upon the consultation with the geneticist, but in the view of eventual consequences of the previous therapy, the patient underwent early amniocentesis at gestational week 16, and the following finding was obtained: 46 XX, normal karyotype. The pregnancy was regular throughout its course (Figure 4). The parturition occurred on October 8, 2002 at 5 a.m. It was a vaginal delivery of the newborn in occipital position with episiotomy. She gave a birth to a live female newborn (Apgar score 9/10). The complete placenta was spontaneously separated and delivered. Manual revision of the delivery canal was performed and the episiotomy was sutured.

Postpartum period was regular. Involution of the uterus was normal as well as serous-blood lochia. The episiotomy wound healed per primam. Control laboratory findings were normal. Lactation was interrupted by bromocriptine agents. Control gynecology examination in week 6 after delivery was normal. The control oncology examination was regular. Twelve years post labor, the patient remains free of disease.



A

B

Figure 3. MRI of both breast after operation. A: precontrast; B: postcontrast

Figure 4. Pregnant patient

Discussion

After the analysis of literature data we realized that there have been a very small number of published reports on the pregnancy following the treated breast cancer. Many more references could be found on the breast cancer associated with pregnancy (1, 10). As far as 10 years ago there was an attitude that the women treated for breast cancer should not get pregnant and deliver. The opinions on the post-breast-cancer pregnancy have changed in concern to the fact that the incidence of breast cancer has been increased in younger age groups, particularly in the women (concern of this paper) with no previous deliveries, and these with good prognostic parameters, long disease-fee interval in which the pregnancy could have been safely planned. In a prospective study oh 694,657 parous women in Norway, 5474 developed breast cancer after their first birth (11). It is generally accepted that early first childbirth is associated with reduced risk of developing breast cancer. In contrast, there is no evidence that pregnancy after breast cancer treatment has a negative influence on the prognosis (10). In the medical literature there are no randomized clinical trials helping in the making decision in this setting. Significant experience already exists in some institutions and can guide management in these difficult cases (12).

In our patient, the BRCA has not been estimated for technical impossibility. It was planned to perform regular controls of the mother and future female child, and the pregnant woman had been introduced with the possible risk of the occurrence of the breast cancer in the female child during her generative period. The parents agreed to the risk. Prenatal testing for BRCA mutation should only be done after extensive counseling of the parents during which not only the medical genetic aspects but also the decision for prenatal BRCA testing and selective termination of views (13). Prenatal BRCA testing is morally defensible only in case of a female fetus. It parents have the intention to terminate the pregnancy when fetus is a carrier, the final decision is in any case up to the parents.

The problem of a pregnancy after treatment for breast cancer is analyzed and this aspect is an emerging issue in clinical oncology. The decision should evaluate for each patient, taking into account the prognosis of the patient and her desire of pregnancy (14). Furthermore it is likely that willingness of pregnancy after breast cancer contains, besides classic constituents of appeals of motherhood, a specific meaning for the recovery of both health and femininity (15).

Although few studies have been done, none have found evidence that pregnancy after successful breast cancer treatment increases the risk of the disease coming back.

Mueller and her colleagues (2003) identified more than 15000 women under age 45 in Seattle, Detroit and Los Angeles who were diagnosed with invasive breast cancer (2). Of those, 438 women gave birth some time after being diagnosed. The researchers compared each of these women with up to 12 women of similar age and race with breast cancer that had not give birth. Women who gave birth 10 months or longer after diagnosis had almost half the risk of dying from breast cancer, compared to women who did not have a child after diagnosis (2). Reduced risk was seen even among women whose disease had spread to the lymph nodes, or who had tumors larger than two centimeters.

Further research that need to be done to determine what risks pregnancy may pose to breast cancer survivors, and if that risk is influenced by factors like age, race, or disease characteristics (16). Such research could take 10 years or more.

Conclusion

In conclusion, our study presented a case of healthy pregnancy and delivery, which occur after the patient had been operated and irradiated for breast cancer. The possibility of recurrence of the disease remains a constant life long hazard.

Abbreviations

BRCA: gene for breast cancer; ER: estrogen receptors; PR: progesterone receptors.

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Renal artery stenosis in a solitary functioning kidney - case report

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Abstract

We report a case of severe hypertension caused by renal artery stenosis of congenital solitary kidney in a 24-year-old female. After an admission of our 24-year female patient to hospital, the initial investigation ruled out endocrine cause of arterial hypertension. The left kidney could not be visualized by the ultrasound examination of the abdomen, so we did the CT scan of the abdomen using per oral and intravenous contrast and the diagnosis of left kidney agenesis followed by the compensatory enlargement of the right kidney was established. While some cases of renovascular stenosis may be diagnosed by Doppler ultrasound, other cases have demonstrated that this technique may miss the diagnosis of renovasular hypertension. Renal angiography revealed a stenotic area in the upper renal artery of a solitary functioning kidney. It was 1.5 cm wide; the degree of the stenosis was over 60%. Renal artery supplying the inferior part of the kidney was without any pathological changes. Although renal arteriography is the golden standard in diagnosing renal artery stenosis, there are certain risks: procedure- related complications and contrast induced nephropathy.

Endovascular treatment is an alternative to surgery with lower morbidity rates. Stenting the stenotic renal artery in solitary functioning kidney either improves or stabilizes the renal function and provides stabilization of the blood pressure. Implantation of stent in upper renal artery of the solitary functioning kidney in our patient led to normalization of hypertension and improvement of renal functioning.

Key words: solitary kidney, renal artery stenosis, renal artery stent

Introduction

The stenosis of renal artery or/and its branches is mostly caused by atherosclerosis or fibromuscular dysplasia, while blood vessel diseases are less common. It is the cause of all cases of hypertension in 2-5% (1), with fibromuscular dyslpasia more common in women under 40 years of age, while atherosclerosis is more frequent in men with risk factors for developing atherosclerosis over fifty years of age (2).

According to Roodhoft et al. unilateral renal agenesis is present in 1 : 500 in general population (3), which is more often than seen on autopsies (4).

Renal artery stenosis in a solitary functioning kidney is a rare condition, and it is associated with hypertension, depletion of renal function, high morbidity and mortality (5-7). Considering morbidity and mortality characteristics of the patients with the renal artery stenosis in a solitary functioning kidney, it is an imperative to detect these patients as early as possible using a set of diagnostic procedures in order to choose an adequate treatment regimen.

The goal of the treatment is to improve or normalize blood flow through an affected kidney, correct the renal artery stenosis, regulate arterial blood pressure. This can be achieved by medical management or by using certain percutaneous interventions or surgical revascularization (2).

Case report

A twenty-four year old female was admitted to hospital presenting with headache, nausea, vomiting, high artery blood pressure (220/120 mmHg) and tachycardia. Thorough anamnesis revealed that she had been having occasional headaches

with nausea for approximately two months, which was the reason for going to the general practitioner a day prior to hospitalisation at our Clinic, who diagnosed hypertension and prescribed antihipertensives which the patient did not use.

The family history showed that the father of our patient had arterial hypertension.

Physical examination of the patient showed the following: sinus tachycardia (100/min), the discreet systolic murmur over all valves and arterial hypertension (200/120 mmHg). All periphery pulses were palpable. Echocardiography revealed concentric hypertrophy of the cardiac muscle of the left ventricle, and neither the signs of aortic dissection nor the significant gradient at the isthmus were present. Radiogram of the heart and lungs showed normal heart silhouette without any signs of the left ventricular hypertrophy. On the count of severe headache, after initial lowering of the artery blood pressure using ACE inhibitors (nifedipin 40 mg per orally) and calcium channel blockers (captopril 50 mg), we performed an urgent CT scan of the endocranium, which did not show any abnormalities. Urgent laboratory investigations showed an increase in creatinine (152 μmol/l with the upper reference limit 125 μmol/l) and urea (15.5 mmol/l with the upper reference limit 8 mmol/l) (Table 1).

We performed all the necessary laboratory investigations and ruled out an endocrine cause of the hypertension (Table 1). Screening for risk factors for hypertension pointed out only the hypercholesterolemia (Table 1).

The left kidney could not be visualized by the routinely done ultrasonographyc examination of the abdomen, so we did the CT scan of the abdomen using per oral and intravenous contrast and the diagnosis of left kidney agenesis followed by the compensatory enlargement of the right kidney was established (Figure 1). Doppler ultrasound visualised the renal artery partially, with the nor-

Table 1. Laboratory tests

Analysis	Result	Reference range
WBC	6,9 x l0^9/l	4-10 x 10^9/l
RBC	4,58 x 10^{12}/l	3.9-6.0 x 10^{12}/l
Haemoglobin	130 g/l	120-160 g/l
Platelets	154 x 10^9/l	140-150 x 10^9/l
Aspartat transferase	27 U/l	5-37 U/l
Alanin transferase	10 U/l	5-40 U/l
γ- glutamyl transpeptidase	11 U/l	7-38 U/l
Alkaline phosphatise	54 U/l	30-115 U/l
Total bilirubin	8 μmol/l	3-21 μmol/l
BUN	8.8…15…7.8 mmol/l	2.5-7 mmol/l
Creatinine	152…112 μmol/l	30-127 μml/l
Sodium	141 mmol/l	135-155 mmol/l
Potassium	4.6 mmol/l	3.5-5.5 mmol/l
Chloride	108 mmol/l	95-105 mmol/l
Total proteins	70 g/l	60-80 g/l
Albumins	48.8 g/l	35-50 g/l
Total cholesterol	7.26 mmol/l	4-5.20 mmol/l
Triglycerides	0.52 mmol/l	<1.7mmol/l
Thyroid-stimulating hormone	1.25 mIU/l	0.41-5.12 mIU/l
ACTH	7.54 pg/ml	9-46 pg/ml
Aldosterone	402.9 pg/ml	40-310 pg/ml
Adrenalin-urine	27.3 nmol/dU	10.9-120 nmol/dU
Noradrenalin-urine	140.1 nmol/dU	94.6-425.6 nmol/dU
Dopamine-urine	998.2 nmol/dU	948.8-2611.3 nmol/dU
Urine proteins	3…0	0
Glucose	4.6 mmol/l	3.5-5 mmol/l

mal lumen and normal rate of blood flow on the segment which could be seen. Renal angiography was the next diagnostic step, and it revealed a stenotic area in the upper renal artery of a solitary functioning kidney. It was 1.5 cm wide; the degree of the stenosis was over 60%. Renal artery supplying the inferior part of the kidney was without any pathological changes. (Figures 2, 3, 4).

Given all the facts, it was clear that permanent treatment of the artery hypertension and it's underlying cause, i.e. renal artery stenosis, was necessary, so the percutaneus transluminal angioplasty of the upper right renal artery with the placing the stent was done (angioplastica percutanea transluminalis arteriae renalis superioris dextri cum stent – Palmaz blue 5x18). The procedure was performed by a vascular interventional radiologist.

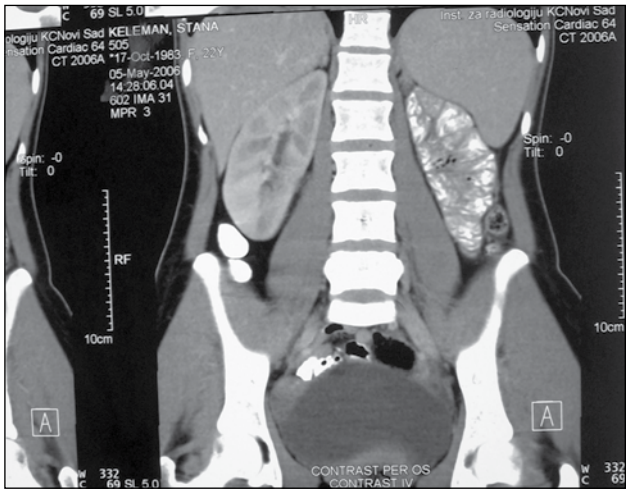

Figure 1. CT scan showing the absence of the left kidney

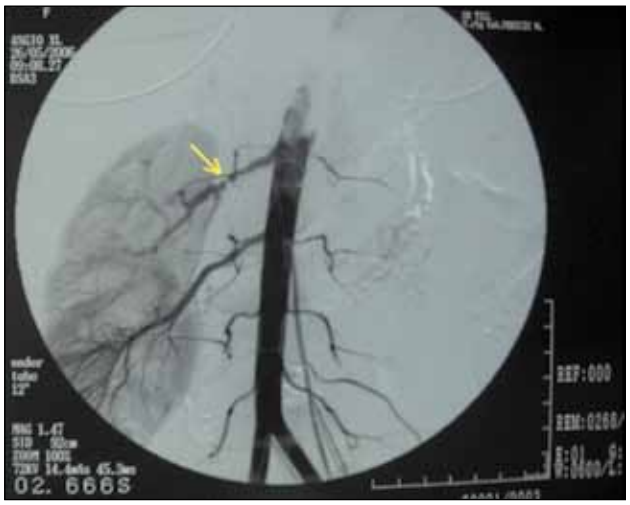

Figure 2. Renal angiography showing the stenotic area in the upper right renal artery

Figure 3. Renal angiography showing the stenotic area in the upper right renal artery

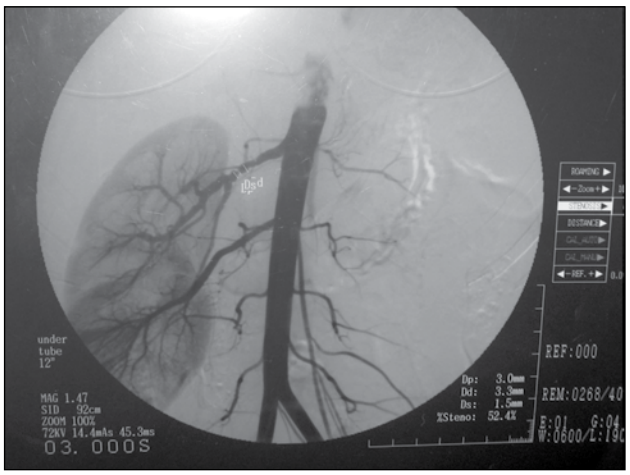

Figure 4. Renal angiography showing the stenotic area in the upper right renal artery

In the course of the post interventional period we treated the patient with small doses of ß-blockers, statins and antiaggregational agents, the blood pressure normalized, which was confirmed by the twenty-four hours blood pressure monitoring. Renal function improved, as well. The control multislice CT contrast angiography showed good position of the stent and adequate lumen of the renal artery (Figures 5, 6, 7).

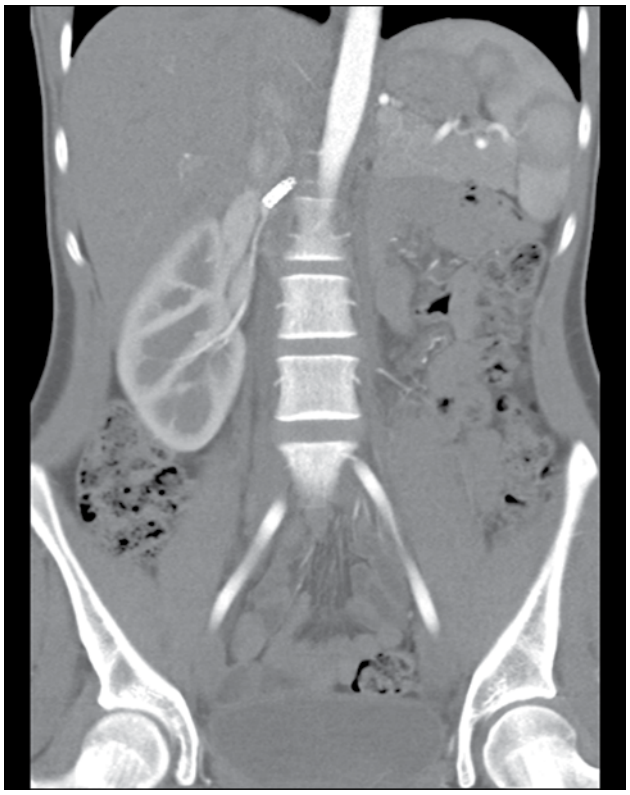

Figure 5. CT angiography showing the position of the stent in the upper right renal artery

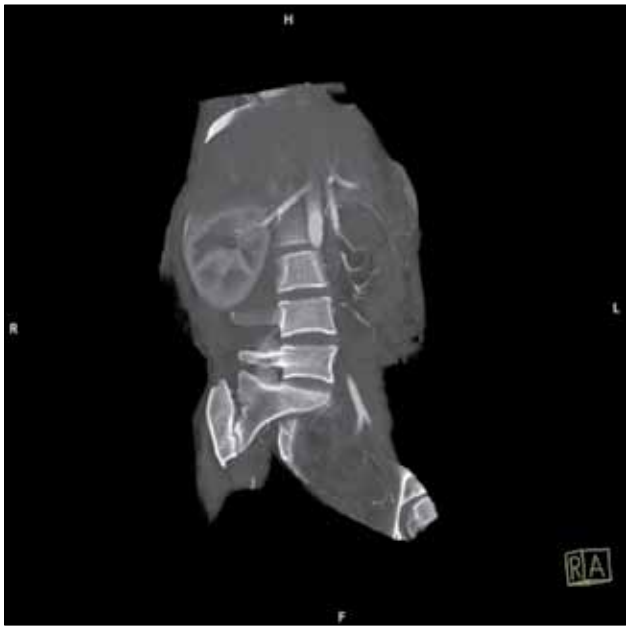

Figure 6. CT angiography showing the position of the stent in the upper right renal artery

Figure 7. CT angiography showing the position of the stent in the upper right renal artery

Discussion

This case report is educative for several reasons.

The fact that unilateral renal agenesis was diagnosed in a twenty-four year old patient, considering the ability to use non-invasive, reproducible and precise enough ultrasonographyc examination of abdomen and kidneys can not be neglected. Considering the age of our female patient, undiagnosed renal agenesis, impairment of renal function and the arterial hypertension which can be accompanied with severe complications could have had its first manifestation during pregnancy. The worsening of the hypertension and the development of preeclampsy with greater risk for foetal and maternal complications is to be expected (8).

The arterial hypertension in patients with solitary kidney can be found in a current literature. Lan et al. had observed fourteen children with unilateral agenesis and showed the greater prevalence of hypertension, proteinuria and renal insufficiency in 29%, 43%, 36% respectively, compared to the group of the patients who underwent unilateral nefrectomy (9). The incidence of congenital solitary kidney in this study was 1: 1496. The authors

pointed out that the complications such as arterial hypertension, proteinuria and renal insufficiency were frequent in patients between the age of 30 -60. Peco-Antic A. et al. presented the case of a four months old patient with renal artery stenosis in congenitally solitary kidney with pelvic localisation (10). Hayashida M. et al showed a case report of a twenty-four year old woman with renovascular hypertension, thus making our case a non unique one (11). This patient had been treated as essential hypertension since she was nineteen, all the way to the preeclampsy and HELLP syndrome (haemolysis, elevated liver enzymes, low platelet count) at the 28. week of gestation.

On the other hand, performing certain diagnostic procedures opens some dilemma. Considering the age of our patient and the abrupt onset of hypertension and tachycardia we suspected the endocrine cause of hypertension, which we excluded by the laboratory and morphological examinations. Urgent abdominal ultrasound failed to visualize the left kidney, so the CT scan of the abdomen followed, and showed left kidney agenesis with the compensatory enlargement of the right kidney. Doppler ultrasound of the right renal arteries did not verify any pathologic changes. It was only after the renal angiography had been done, that the stenotic area in the upper right renal artery was seen. Some cases of renovascular lesions can be diagnosed using Doppler ultrasonography, while in some, like ours, pathologic changes might stay undiagnosed. So, the normal findings on the Doppler ultrasonography should be accompanied by other techniques using methods with radioactive isotopes or/and angiography. Although the renal angiography is the „golden standard„ in diagnosing renal artery stenosis and revealing the underlying cause of the stenosis, this procedure may be accompanied with certain complications including the onset of contrast induced nephropathy (CIN). These risks are especially important in patients with a solitary kidney, which are categorized as a high-risk population for performing such procedures.

The general recommendation in diagnostics and treatment of hypertensive patients cannot be given, considering the low prevalence of renovascular hypertension in the general population of hypertensive patients, together with the cost and limitations of certain screening tests. The turn and the significance of diagnostic procedures used should depend on the characteristics of each patient, clinical findings and suspected reason for renovascular hypertension (fibromuscular dysplasia or atherosclerosis), as well as on whether the renal insufficiency is present and the eventual risk of contrast angiography. It depends upon the ongoing antihypertensive therapy, which can affect rennin- angyotensin system (RAAS), too (12).

There are not only the dilemmas in diagnostics, but in therapy regimen, as well. The goals in treating renovascular hypertension are to control arterial blood pressure, preserve renal function and prevent the development of the complications (12). The medicament treatment, percutaneous interventions and surgical revascularizing procedures are the therapeutical options.

Satisfactory result in treating renovascular hypertension in patients with solitary functioning kidney can hardly be achieved only by medications. More efficient are the interventional radiology methods (percutaneous transluminal angyoplasty with stent).

Having the morbidity and mortality characteristics of the patients with the renal artery stenosis in a solitary functioning kidney in mind, early renal angioplasty with or without placing the stent in the affected artery in order to establish normal renal vascularisation is recommended (13,14). Watson et al. observed the effects of stenting on kidney function in a prospective study on thirty-three patients with chronic renal failure and bi- or unilateral renal artery stenosis with solitary or single functioning kidney (15). Prior to positioning the stent all patients suffered from renal insufficiency. After stenting the improvement of renal function was observed in eighteen patients. Shanon et al. showed the use of stent in patients with solitary functioning kidney, renal artery stenosis and impaired renal function (16). During the follow up period of six to twenty-five months, normalization of renal function was achieved in 24% of the patients, improvement in 19% while deterioration of renal function was seen in 29% of the patients. Sahim S et al. showed clinical results in stenting renal artery in order to treat renovascular hypertension in patients with solitary functioning kidney. In 6.7% patients the arterial hypertension was cured, it was improved in 26.6% and stabilized in 66.7% of the patients. The impro-

vement of renal function was observed in 60% of the patients, while it was stabilized in 26.6% of the patients. 13.4% of the patients had the worsening of the renal function (17). All these authors pointed out the significance of percutaneous recanalisation with stent implantation as a safe and efficient procedure in controlling the arterial blood pressure in patients with renal artery stenosis in a solitary functioning kidney.

The renal artery stenosis in a solitary functioning kidney is a difficult state accompanied with hypertension, progressive renal insufficiency and higher morbidity and mortality risk, so the tendency in treating these patients is to use minimally invasive procedures (13). The study of Cioni R et al, which followed up patients with the stent implantation in renal artery of the solitary kidney showed this form of treating to be relatively safe alternative to conventional surgical procedures in these high risk patients. There was an improvement or stabilizing of renal function in 74% of the participants (13). The percutaneous transluminal angioplasty with solitary functioning kidney leads to a clinical benefit in these patients (14). Further studies are necessary in defining criteria for identifying these high risk patients who can benefit from therapeutic procedures. However, one should always keep in mind that there are numerous variations of renal vascular supply (hilar supera-numerary renal arteries) (18).

There was an obvious and abrupt correction of arterial hypertension and renal function improvement in our patient after percutaneous trasluminal angioplasty with stenting the upper right renal artery, and the procedure went on without any complications.

Conclusion

Implantation of stent in upper renal artery of the solitary functioning kidney, as safe and efficient procedure, in our twenty-four female patient led to normalization of hypertension and improvement of renal function.

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Quality of life in students of University of Sarajevo in accordance to recommendations for lifestyle modification

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Abstract

Introduction: The development of cardiovascular disease is closely linked to lifestyle and risk factors of this disease. There are scientific evidences that change of lifestyle with reduction of risk factors can slow the development of cardiovascular diseases before the onset of clinical manifestations. Prevention of cardiovascular disease should include people with multiple risk factors, no manifesting signs of disease, people with latent diseases as well as by people with cardiovascular diseases. In all three groups preventive actions achieve successful results and the best are those in the first group where there have been no clinical manifestations of disease. Internal medicine practice applied to the young student population is an example of a strategy of prevention in medicine, because it promptly discovers symptoms of cardiac diseases and disorders, but is also in extremely favorable position to deal with the causes and risk factors of cardiac disorders and diseases.

Objective: Analysis of quality of life of students at the University of Sarajevo and issuing recommendations for lifestyle modification.

Materials and methods: The study was prospective, retrospective, clinical, and descriptive analytical. The sample consisted of the University of Sarajevo students. The sample included students in regular and systematic examinations of the Institute for Health Protection of Students University of Sarajevo in the period 2005 - 2010.

Results: Sports activities in all patients- 91 patients or 84% do not train, 10 or 10% trains,8 or 6 % trains sometimes. Lifestyle and nutrition for all patients: 58 or 53% live at parents, 44 or 40% of are tenants, 6 or 6 % live in dormitory, 1 or 1% live alone. Regularity and quality of meals and nutrition for all patients: 48 or 42% irregular meals mostly fast food, 51 or 49% regular, good quality food, 10 or 9% of regular, high calorie diet. Smoking in all patients: 67 or 62% are not smoking, 33 or 30% are smoking, 9 and 6% occasional smoking. The energy level of all patients was with 94 or 86% lower energy level, 15 or 14% good. Number of hours spent on exercises, lectures and study: 3-5 hours 25 patients or 23%, 6-8 hours 64 patients or 64%, 9 - 10 hours 16 patients or 15%, 11 hours or more 4 patients, or 4%. Out of investigated population 94% of patients spent war in Bosnia.

Key words: The University of Sarajevo students, conditions, housing conditions and nutrition, quality and regularity of meals, sports activities, smoking and alcohol, general state of fitness and energy, sleep-wake rhythm, time spent on exercises, lectures, studying; war period, prevention of cardiovascular disease; recommendations for lifestyle modification.

Introduction

The development of cardiovascular disease is closely linked to lifestyle and risk factors of these diseases. There are scientific evidences that lifestyle changes to reduce risk factors can slow the development of cardiovascular disease before the onset of clinical manifestations. Prevention of cardiovascular disease should include people with multiple risk factors, no manifest signs of disease, people with latent diseases as well as by people with cardiovascular disease. In all three groups preventive actions achieve successful results, and the best are those in the first group where there have been no clinical manifestations of disease. Internal medicine practices applied to the young student population is an example of a strategy of prevention in medicine, because it promptly discovers symptoms of cardiac diseases and disorders, but is also extremely favorable position to deal with the causes and risk factors of cardiac disorders and diseases.

Materials and research methods

Sample consisted of the University of Sarajevo students. The sample included students in regular and systematic examinations of Institute for Health Protection of Students University of Sarajevo in the period 2005 - 2010. Personal history of young student population between 18-26 years involves assessing the status of the patient through all aspects of life. Questions must not be suggestive. Important life events should be noted to give the appropriate advice. A very important fact is information about previous illnesses, sports and family history. An essential anamnestic data for students is also faculty that participant attends.

Survey:

1. The conditions, housing conditions and nutrition;
2. The regularity and quality of meals;
3. Sports activities;
4. Smoking and alcohol;
5. General state of fitness and energy;
6. The rhythm of sleep and waking;
7. The time spent on exercises, lectures, studying
8. War period.

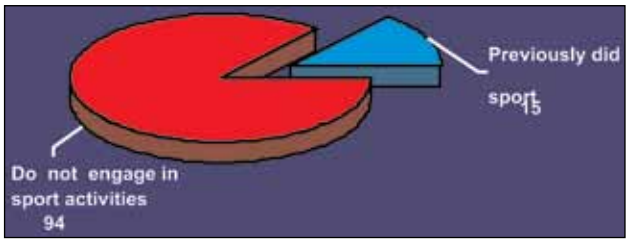
Aim of the investigation

Analysis of quality of life of students at the University of Sarajevo and issuing recommendations for lifestyle modification.

Results with discussion with recommendations to students for lifestyle modifications

Table 1. Display of previous sport activities for all participants

Table review of previous sport activities for all patients		
Type	**Number of participants**	**%**
Did previous sport activity	15	14 %
No previous sport activity	94	86 %
TOTAL	**109**	**100%**

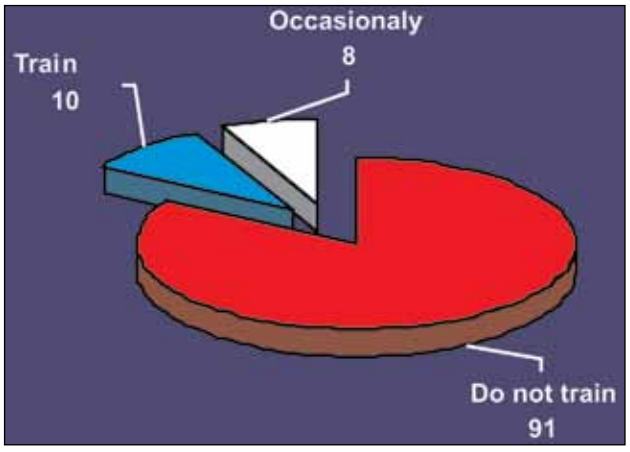


Graph 1. Relation of previous sport activities in all patients

Most of examined patients did not engage in sport activities. Highly significant response on level p<0,0000 was for total sample with t=7,46, and for girls with t=7,96. For young men difference is less significant on level p<0,05 with t=2,37, while it is much more significant compared to girls on level P<0,005 with t=2,93.

Table 2. Display of presence of sport activities in all patients

Table display of previous sport activities for all patients		
Type	**Number of participants**	**%**
Does not train	91	84 %
Trains	10	10 %
Trains sometimes	8	6 %
TOTAL	**109**	**100%**



Graph 2. Relation of sport activities in all patients

Most of examined patients did not train with highly significant difference on level p<0,0000 for total sample with t=7,46 and t=8,45, and for girls with t=7,09 and t=6,79. For young men that difference is less significant on level p<0,05 with t=3,36 i t=3,74.

Summary of investigation of sport activities in students with recommendation on importance of active life

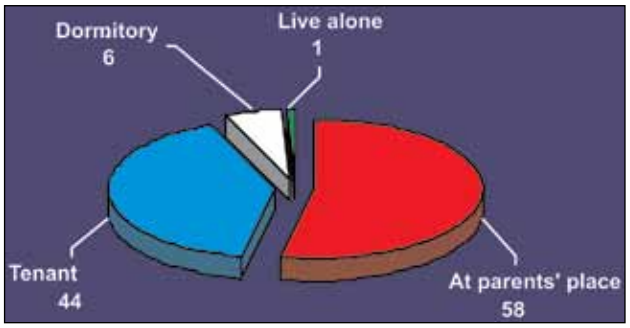
From these results of part of the questionnaire regarding sports activities of students we gained disturbing facts on their reduced physical activity while 84% of students surveyed do not currently practiced sports.

Recommendations to the students on importance of physical activities:

a) It helps you feel better;
b) A stronger heart, this is a very important fact for us that we live in a culture in which every second someone dies from heart and cardiovascular diseases;
c) Lowers blood pressure and slows heart rate, thus protecting the heart and blood vessels, lowers blood cholesterol and LDH, increases HDL cholesterol, thus reducing the risk of heart and vascular diseases;
d) Strengthen bones by helping them to retain minerals and calcium;
e) Removes depression, exercising in nature is one of the most useful resources for the fight against this disease that so often leads to disability;
f) Frees from anxiety and stress, it was shown that physical activity is an effective remedy against stress in busy lives exposed to various pressures;
g) Increases overall energy and efficiency in all the individual areas of life;
h) It helps maintain desirable body weight;
i) Improves circulation and promotes mental clarity, better sleep, faster healing of damaged body parts

Table 3. Display of lifestyle and nutrition habits in all patients

Table display of nutrition and lifestyle habits in all patients		
Type	**Number of patients**	**%**
At parents	58	53 %
Tenant	44	40 %
Dormitory	6	6 %
Lives alone	1	1 %
TOTAL	**109**	**100%**

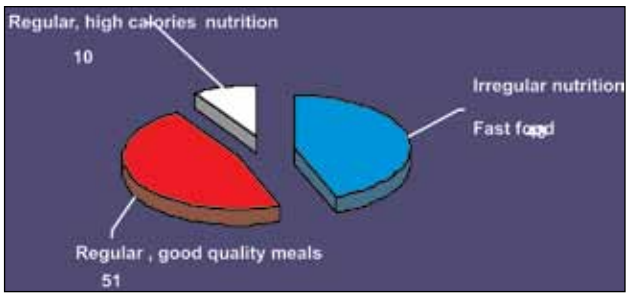


Graph 3. Relation of lifestyle and nutrition in all patients

At the time of examination most of participants ate at parent's place. For total sample the difference is highly significant on level p<0001 with t=4,02 and on level p<0,0000, with t=4,36. There is no statistically significant difference among genders.

Table 4. Display of regularity and quality of meals in all patients

Table reivew of regularity and quality of meals in all patients		
Type	**Number of participants**	**%**
Fast food, irregular meals	48	42 %
Regular, good quality food	51	49 %
Regular, high calorie food	10	9 %
TOTAL	**109**	**100%**



Graph 4. Relation of regularity and quality of meals in all patients

There is no statistically significant difference among genders. In total sample only significant difference on level p<0,005 with t=3,27 among students, who eat irregularly and those on high calorie food.

Summary of investigation for quality and regularity of meals and nutrition for students with the recommendations of the importance of healthy eating

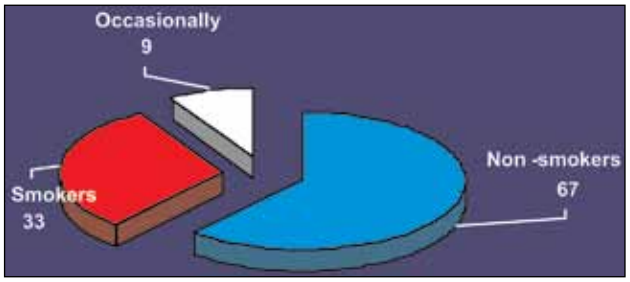
Data from patient questionnaire regarding the regularity and quality of nutrition among students suggests the wrong eating manners for more than half of the students, where we get to the data that are high calorie meals, without nutritive value, the food with too much fat, sugar, cholesterol and excessive amounts of salt. Excessive amounts of calories and often meals. Summary is that the wrong food is a foundation of many diseases: coronary heart disease, stroke, high blood pressure and diabetes.

Recommendations to students about the importance of healthy eating:

a) Studies indicate that modern man takes 20% more calories from your daily intake from processed sugars and sweeteners. These sugars are empty calories devoid of fiber and nutrients. Because of its high calories, they are suitable for the promotion of obesity;
b) Refined foods: It was believed that refined foods are good because they have removed them from unnecessary ingredients. Today we know that the fiber and how valuable and necessary, because we kept the TYPE of some cancers, stabilize sugar and cholesterol levels, help maintain normal body weight and reduce the occurrence of disturbances in the gastrointestinal tract;
c.) Salt: Most of the inhabitants of Western countries take 7:50 grams of salt a day. It is manifold more than the actual needs of the body, and the amount of salt greatly contributing to the body burden of high blood pressure and heart disease;
d) Fats: Most people are unaware that over 37% of calories intake accounts to fat. It is much more than what the body can be routinely processed. Therefore, there are damaging consequences such as a blockage of blood vessels, heart and brain damage, diabetes mellitus type II and overproducing body weight;
e) Students rarely drink water. Instead, daily drink endless liters of soft drinks, beer, coffee, tea and juices. Since most of these beverages rich in calories, they can adversely affect blood sugar levels, and body weight.

Table 5. Display of smoking habits in all patients

Table review of smoking in all patients		
Type	**Number of participants**	**%**
Non-smokers	67	62 %
Smokers	33	30 %
Occasionally smokes	9	6 %
TOTAL	**109**	**100%**

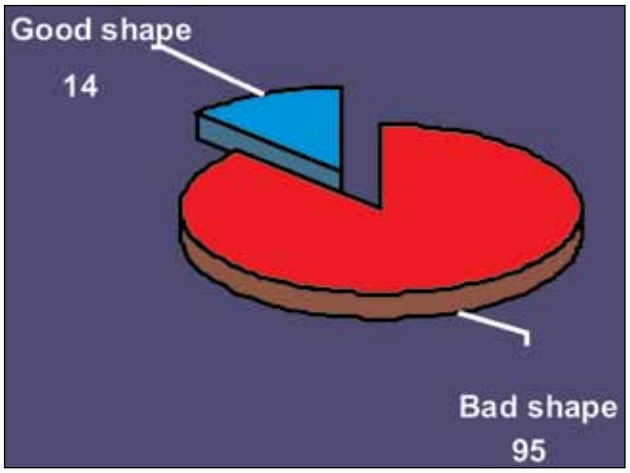


Graph 5. Relation of smoking habits in all patients

Most of examined do not use alcohol with highly significant level p<0000 and t=5,66. The difference is less significant compared to smoking on level p<0,005 with t=3,22. Girls gave almost same answer with highly significant difference on level p<0,0000 with t=4,54 for alcohol and less significant difference on level p<0,001 with t=3,4 for smoking.

Table 6. Display of fitness state in all patients

Table display of fitness in all patients		
Type	**Number of participants**	**%**
Bad shape	95	87 %
Good shape	14	13 %
TOTAL	**109**	**100%**

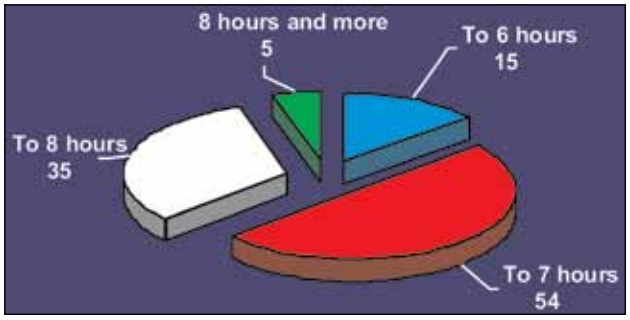


Graph 6. Relation of fitness stae and energy level in all patients

Most of examined patients believe they are in bad shape with highly significant difference on level p<0,0000 with t=7,69 for total sample and with t=7,26 for girls. For young men a significant difference is lower on level p<0,005 with t=3,38.

Table 7. Display of number of sleep hours in all patients

Table display of sleep hours in all patients		
Type	**Number of participants**	**%**
Up to 6 hours of sleep	15	14 %
Up to 7 hours of sleep	54	49 %
Up to 8 hours of sleep	35	32 %
Sleeping to 9 hours and more	5	5 %
TOTAL	**109**	**100%**

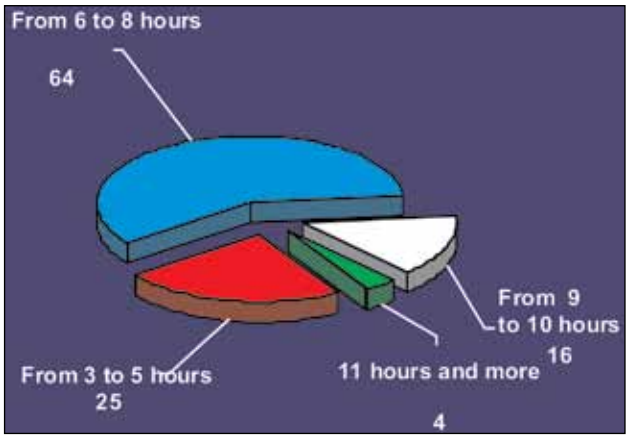


Graph 7. Relation of number of sleep hours in all patients

Most examined patients sleep to 7 hours, with highly significant difference for total sample on level p<0,0001 with t=3,88. For girls the difference is less significant p<0,005 with t=2,93, and for young men even lower with p<0,01 and t=2,73.

Table 8. Display of hours spent at excersizes, lectures and studying in all patients

Table display of time spent at excersizes, lectures or studying in all patients		
Type	**Number of participants**	**%**
From 3 to 5	25	23 %
From 6 to 8	64	64 %
From 9 to 10	16	15 %
From 11 and more	4	4 %
TOTAL	**109**	**100%**



Graph 8. Overview of the relationship hours spent on exercise, lectures and training in all patients

Most of examined young men study 3-5 hours daily, without significant difference compared to girls and within male groups. Most girls study 6-8 hours daily with highly significant difference on level p<0000 with t=4,78,t=4,7 and t=5,25 compared to other girls. In total sample there is a highly significant difference on level p<0,0000 with t=5,22 and t=4,56,and on level p<0,0001 with t=3,97.

Summary of research efforts of poor effort tolerance, poor fitness and reduced energy in students with recommendations on the importance of proper rest

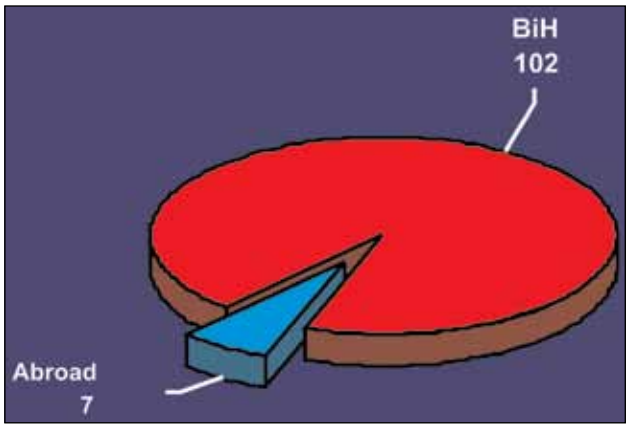
Data on the poor effort tolerance, poor fitness and reduced energy in more than half the student points to multiple causes, which individually or mutifactorial cause these discomforts. On the one hand this points to errors in their lifestyle, sedentary lifestyle, high calorie fast food, inversion of sleep, smoking and the presence of stress related to exams, or the weight of objective scientific - teaching process through which pass daily. Low tolerance of effort can be a sign of significant heart defect. Based on the above we make a conclusion that is done keeping in mind that our study analyzed students who came for suspected or confirmed cardiac problems, the fact they get tired easily, partly are reflection of objective cardiac problems, associated with the inappropriate style of living and severity of the process of study, become pronounced. It is necessary to perform cardiac evaluation: ECG, chest x-ray and heart ultrasound.

Recommendations are that students need a proper vacation:

a) Rest strengthens the immune system and helps protect against disease.
b) Rest allows your body and removes waste material. During this time updated are inventory of various enzymes in the body, as well as energy itself.
c) Proper rest can prolong life.

Table 9. Display of presence in B&H in war period for all patients

Table review of living in B&H during war period		
Type	**Number of participants**	**%**
Abroad	7	6 %
Bosnia and Herzegovina	102	94 %
TOTAL	**109**	**100%**



Graph 9. Display of presence in B&H in war period for all patients

Most of examined patients spend war period in BiH with highly significant difference on level $p<0,0000$ with $t=9,48$

The fact that the war in Bosnia & Herzegovina spent 94% of investigated students is for special analysis and study. Taking into account the fact that we have included in this study age group of students ages 1983 to 1991, the author concludes that in time of war our respondents were between one year and 8 years of life. In conditions of extreme existential threat there were opportunities for the emergence and development of many diseases, and cardiovascular. Poor diet, insufficient intake of vitamins and minerals, hard living conditions, cold and wet rooms, basements and shelters, refugee centers, risky hygienic-epidemiological situation, irregular and inadequate health care, permanent stress - are sure the path to the emergence of all type of diseases, and progression of many other that we can detect and track only now. This survey covers students whose childhood carries the stamp of a dramatic time that it was fertile ground for infectious, metabolic, toxic agents, as well as the initiation of immune and autoimmune reactions whose consequences are now summarize. There are significant data on the presence of congenital and acquired heart defects in young patients, students. The study based on anamnestic data and those obtained via questionnaire we got to the obvious indicators of errors in the lifestyle and way of life of students with possible influence on the cardiac status and cardiac arrhythmias in students, and we have made initial recommendations to reduce risk factors: smoking, excessive body weight, physical inactivity, etc.

Conclusion

Sports activities in all patients: 91 or 84% do not exercise, 10 or 10% exercise, 8% or 6 exercises sometimes. Food habits and nutrition for all patients: 58 or 53% eat at parents, 44 or 40% are tenants, 6 or 6 % stay at dormitory, 1 or 1% live alone. Regularity and quality of meals and nutrition for all patients: 48 or 42% consume irregularly and mostly fast food, 51 or 49% regular, good quality food, 10 or 9% of regular, high calorie diet. Smoking in all patients: 67 or 62% do not smoke, 33 or 30% smokers, 9% or 6 sometimes smoke. The energy level of all patients with: 94 or 86% lower energy level, 15 or 14% good energy level. Number of hours spent on exercises, lectures and studying: 3-5 hours 25 patients or 23%, 6-8 hours in 64 patients or 64%, 9-10 hours patients 16 or 15%, 11 more hours and 4 patients, or 4%.

Out of investigated patients 94% of them spent war in Bosnia & Herzegovina. The study based on anamnestic data and those obtained via questionnaire we got to significant parameters of errors in the lifestyle and way of life of students with possible influence on the cardiac status and cardiac arrhythmias in students, and we have made initial recommendations to reduce risk factors: smoking, excessive body weight, lack of physical activity and more.

Internal cardiac practice applied to the young student population is an example of a strategy of prevention in medicine, because it promptly discovers symptoms of cardiac diseases and disorders, but is also in extremely favorable position to deal with the causes and risk factors of cardiac disorders and diseases. We want to gain relevant parameters that our health is determined by our lifestyle choices, relatively of what we are willing to do for ourselves-to show what habits of our life we choose, especially about what we eat, drink, exercise, smoke or not. In this paper, applied to the student population, we have an opportunity to deal with it, because it is a population that is willing to cooperate and learn.

Students gladly accept information about health, lifestyle mistakes that lead to disease and are one of the fittest populations for the modification of lifestyle. Many due to ignorance violate the laws of health, but most students actually know more than their way of living shows that. They should be brought to the point that they use the knowledge they have as a rule of life. Young people - students can serve as the best pattern for a long studied and desired medical road of prevention, through early diagnosis of disease, via decisions on better quality of life to a complete recovery. This study indicates the need for the development of preventive cardiology strategies of action in the manner of engagement team of experts through lectures, publication of brochures and DVDs.

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Causes and differences in stress experience between doctors and nurses/medical technicians employed in Bureau of Emergency Medical Services of Canton Sarajevo

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Abstract

Introduction: Fifty years ago no one used the word stress to describe personal anxiousness. In decades that followed stress has become the most frequent psychological phenomena of our society, and cause for the most health problems of any kind.

Aim: The aim of this research is to examine factors of stress, so called stressors, at work. That includes experience (subjective) of the employees with stressors they encounter, and difference in experience between doctors and nurses/medical technicians.

Respondents and methods: 115 health care workers (nurses/medical technicians and doctors) employed at the Bureau of Emergency Medical of Canton Sarajevo participated in this research in the period of June-July 2011. In this work we used descriptive research method type, sectional studies at present time.

Results: The results of the research were obtained by a questionnaire (Likert scale) which consisted of 37 questions related to the stress experience of health care workers at work. Among the most important stressors recognised by this group are: unrealistic expectations of the clients (users) and/or their family members, wrongly informed clients (users), exposure to the inappropriate public criticism, fear of the possible infection, informing family members about the death of their relatives, unpredicted everyday situations, threat of lawsuit, work at dispatching centre, overwork, conflicts with a clients (users) or their family members. For the doctors, the most stressful are the exposure to the inappropriate public criticism and wrongly informed clients (users). Nurses and medical technicians experience unrealistic expectations of the clients (users) and/or their family members more often than doctors, and wrongly informed clients (users), which is the same as with the doctors. Nurses/medical technicians also list the fear of infection as a distinctive stressor at their work place.

Conclusion: Causes of stress at work experienced by health care workers employed at the Bureau of Emergency Medical of Canton Sarajevo are many and of great intensity, and it is established that there is significant difference between experience and intensity of stress between doctors and nurses/medical technicians.

Key words: stress, stress at work, stressors, doctors, nurses/medical technicians.

Introduction

Today stress is talked about as ubiquitous and everyday phenomenon. People more often face the events they could not anticipate, such as: wars, terrorism, new kinds of diseases, non-democratic regimes, disregard of basic social needs of people, groups, and individuals, decay of family, loss of job, etc. Let us add that modern man additionally witnesses them by following them over the different media (1). Stress would probably influence us in some period of our life. We all know some of the most stressful professions such as air traffic controllers, who know that each their mistake can cause plane crush and loss of hundreds of human lives. There are also journalists who can research and uncover different financial brokerage and corruption of large corporations or individuals, and many times we witnessed the murders of journalists, police officers working in dangerous and violent areas, soldiers in unstable and war-affected countries. These are some of the extreme exam-

ples of stress impact on people. But there are also everyday stressful situations with which each of us is quite familiar with, and which are inevitable in everyday life: family relationships, health problems, conflicts with people, traffic jams, lack of time for performing work, loss of personal things, small defects in the house, and many different crises in life (2, 3).

Health care workers also belong to the group of extremely stressful population. It is known in the health care system that health care workers who work in medical emergency institutions (especially in the field) are constantly in the stressful environment, and therefore most exposed to the stress. Nature of health care worker's job in the medical emergency institutions is such that every day they meet unpredictable, medical urgent and physically seriously injured persons, which often provides unsightly scene in the field, which increases stress in health care workers.

Stress is defined as any interference which disturbs mental and physical well being of the individual. It happens when the body works outside its own normal capacity and capabilities (4). Medicine of the 19th century based the term stress on poor health condition, and connected it with cases of angina pectoris. In 1932 Walter Cannon said that the stress is a disorder of homeostasis which happens because of the cold, lack of oxygen, or lowered blood sugar (5). To put it simple, stress is a negative emotional reaction based on cognitive assessment of an event as a threat (6, 7).

During the last decade there has been great interest in research of psycho-social aspects of the healthcare workers operating environment. The reason for that is the exposure to the high levels of stress at work, increased risk of burnout syndrome, role conflict, and dissatisfaction. Numerous researches in different countries prove that prevalence of stress at work by health care workers is high. Prevalence of burnout syndrome by doctor specialists is from 41% to 76 %, while the prevalence of depression in the same group of health care workers is from 7% to 56% (8).

Many researches, conducted in the population of nurses, showed connection between certain diseases and stress at work such as emotional exhaustion, physical exhaustion, and pain in the lower part of the back. Low level of decision making and high demands, which are characteristics for the profession of nurses, maybe connected to increase risk of coronary diseases and mental disorders. The most common cause of stress among Chinese nurses are imbalance between given and obtained, bad image of nursery in society, and organisational problems. In transition countries number of nurses who left their work is in increase (5).

Institute for Science and Technology of the Manchester University published the results of the research on the most stressful professions. Grades are from 0, for the lowest level of stress, to the highest 10, for the highest level of stress. Profession of doctors is graded with 6.8 and that of nurse with 6.5. Stress in health care institutions and their departments varies depending on working place of a doctor or a nurse, so these grades can also vary, which means that at some positions at work nurse has a higher grade for the stress exposure than the doctor and vice versa. The example for that is the work of nurses with patients in terminal phase of life and "difficult patients", where the nurse is under constant pressure and demands from the doctor and relatives of the patient. Extremely stressful situation for all health care workers is the final moment of life and the death of the patient (9).

Aim

The aim is to indentify stressors which mostly cause stress in health care workers and determine difference in stress experience between doctors and nurses/medical technicians.

Respondents and methods

All employees of the Bureau of Emergency Medical of Canton Sarajevo between the age of 18 and 65 who worked at the position of nurse/medical technician or a doctor in a period of June-July 2011, were included in this research. The research was voluntarily and anonymous, and health care workers were informed of the research in written and orally. The research was conducted by applying the questionnaire (Likert scale) under the name "Stress in health care workers at work in Public institution the Bureau of Emergency Medical of Canton Sarajevo.

In this work we used descriptive research method type, sectional studies at present time, where

we got the results with help of The questionnaire about stressors at work. The questionnaire (Likert scale) is standardised and it was taken over from the School of Public Health "Andrija Štampar", Medical Faculty of the University of Zagreb under the name "The questionnaire on the stressors at work in hospital health care workers v 2.0." The questionnaire is partly changed and adopted for the needs of this research. Respondents were offered 37 stressors at work, and they graded their subjective experience of certain stressor at Likert scale with grades 1 (not stressful at all), 2 (rarely stressful), 3 (sometimes stressful), 4 (stressful), 5 (extremely stressful).

Results

The final response rate to the questionnaire was satisfying and at the end of our research we had a sample of 115 respondents. Relative majority of 66 (57,4%) respondents are women while 49 (42,6%) respondents were men. Average age of respondents was 41.9 years average years of service were 15.8 years. The structure of professions: 74 (64,3%) nurses/medical technicians, 1 (0,9%) senior nurse/medical technician 38 (33,0%) doctors, and 2 (1,7%) other respondents.

Ten questions mostly graded with 5(extremely stressful) for the whole observed population: wrongly informed clients (users) - 47 respondents (40.9%), fear of infection possibility - 47 respondents (40,9%), unrealistic expectations of the clients (users) and/or their family members - 46 respondents (40,0%), work at dispatching centre - 46 respondents (40,0%), lawsuit threat - 43 respondents (37,4%), exposure to inappropriate public criticism - 42 respondents (36,5%), overwork - 42 respondents (36,5%), informing family members about the death of their relatives - 40 respondents (34,8%), night work - 38 respondents (33,0%), unpredicted everyday situations - 38 respondents (33,0%).

Ten highest values (mean ± standard deviation) for the total observed population are: unrealistic expectations of the clients (users) and/or their family members – 3.86 ± 1.184, wrongly informed

Table 1. Correlation between ten highest values (mean) of the independent variables (stressors) towards dependant variable profession is shown by scaling

Question (stressor)	Profession	N	$\bar{X}$	σ
Unrealistic expectations of the clients (users) and/or their family members	Nurse/Medical technician	74	3.95	1.270
	Doctor	38	3.76	1.025
Wrongly informed clients (users)	Nurse/Medical technician	74	3.92	1.236
	Doctor	38	3.79	1.094
Exposure to inappropriate public criticism	Nurse/Medical technician	74	3.68	1.294
	Doctor	38	4.00	1.040
Fear of infection possibility	Nurse/Medical technician	74	3.85	1.300
	Doctor	38	3.45	1.267
Informing family members about the death of their relatives	Nurse/Medical technician	74	3.74	1.283
	Doctor	38	3.53	1.224
Unpredicted everyday situations	Nurse/Medical technician	74	3.65	1.254
	Doctor	38	3.74	1.267
Lawsuit threat	Nurse/Medical technician	74	3.61	1.506
	Doctor	38	3.76	1.240
Work at dispatching centre	Nurse/Medical technician	74	3.68	1.406
	Doctor	38	3.53	1.409
Overwork	Nurse/Medical technician	74	3.38	1.421
	Doctor	38	3.89	1.226
Conflicts with clients (users) or their family members	Nurse/Medical technician	74	3.57	1.366
	Doctor	38	3.34	1.321

clients (users) – 3.84 ± 1.189, exposure to inappropriate public criticism – 3.77 ± 1.209, fear of infection possibility – 3.72 ± 1.301, informing family members about the death of their relatives – 3.65 ± 1.250, unpredicted everyday situations – 3.63 ± 1.287, lawsuit threat – 3.63 ± 1.417, work at dispatching centre – 3.61 ± 1.387, overwork – 3.55 ± 1.359, conflicts with clients (users) or their family members – 3.48 ± 1.333.

Cronbach's Alpha coefficient of reliability is 0.951.

Table 2. Statistical significance (T-test) for the dependent variable profession in relation to independent variables (stressors)

Nurse / Medical technician / Doctor	F	Sig.
Inadequate financial income	4.148	0.04
Exposure to inappropriate public criticism	5.799	0.02

Discussion

Our research showed that of ten most stressful values for the whole respondent population of nurses/technicians Unrealistic expectations of clients (users) and/or the members of their families were considered the most stressful. Patients, as a rule, have unrealistic expectations from nurses and health care workers in general, which is natural, because they come to a health care institution with their needs and demands they hope to be solved by health care workers. Nurses/medical technicians spend more time with patients than any other health care worker, from the admission, by solving their needs and requests, to the release. The following strong stressor for nurses/medical technicians are wrongly informed clients (users), which we have already mentioned as the strong stressor for doctors. Nurses/medical technicians we questioned stated the fear of infection as extreme stressor at work. Namely, all works of medical – technical interventions, such as cleaning and bandaging wounds, providing of parenteral therapy, administration of medications, and similar, expose the nurse/medical technician to higher risk of infection than any other health care worker.

Our research showed that of ten most stressful values for the population of doctors, the most stressful is considered the exposure to inappropriate public criticism. This sort of stress has its source in media reports and often incorrect unprofessional criticism of doctor's work, with huge consequences for professional and social position and reputation of some doctors and medical institutions (10). Beside inappropriate public criticism, the following strong stressor is considered to be overwork. This simply means too much work and a little time for doing that work. This is very common with assistant workers, which mean workers whose primary task is helping the others. Reports show that overwork or the perception of the overwork is primary reason of burnout for teachers, social workers, supervisors of social work, school psychologists, and health care workers (2). Research in Finland about sick benefit of doctors showed that bad team work at work has a greater influence on high rate of sick leaves than overwork or low control at work. We also can explain overwork as the lack of medical stuff, which means the insufficient number of doctors in relation to workload (especially during summer or winter when there is a greater number of patients at the emergency because of the seasonal injuries). Wrongly informed clients is the stressor which is very stressful for the doctors. Recently the expectations of patients have dramatically increased, much faster than the possibilities of the institutions to satisfy their demands. Although patients, more than ever before, dispose of much more efficient and effective diagnostics and treatment, in most of the countries spiral of financial investments in health care grows faster than inflation spiral – public pessimism about the future of health care systems is in increase. Why is that so? While the most users of health care are satisfied with care they receive, there are still those who have bad experience with health care system, and the minority of them complain (11). In this context we can also mention unrealistic expectations of clients, which means everyday flow of information from different media about different quasi-doctors, medications, and procedures, that can cure everything and everyone, so the expectations from doctors and classical (official) medicine are unrealistic.

With regards to the profession of a nurse/medical technician towards a doctor, there is a statistically significant difference related to financial income, where the value of the significance is p

= 0.04, so with certainty of 95% we can say that the population of nurses/medical technicians is more exposed to this stressor than the population of doctors. For the stressor exposure to inappropriate public criticism, where significance is p = 0.02, we can affirm with certainty of 95% that the population of doctors is more exposed to the stress than the population of nurses/medical technicians.

As we can see in case of stressor of exposure to the public criticism, respondents with faculty diploma and doctors are statistically much more under stress with regard to respondents with secondary school diploma and nurses/medical technicians. We explain this with the fact that employees with faculty diploma, where we include doctors, are more exposed to the stress than respondents with secondary school diploma, where we include nurses/medical technicians. This may happen because of the professional and/or positional authority, and that is why this population is so sensitive to the criticism, and so to the public and inappropriate. Inadequate financial income of nurses/medical technicians has significant statistical value with regard to the doctors simply because of the lower salary, that means workload in relation to salary.

We managed to find original scientific work on the subject of stress in health care workers by Knežević B. and co. published in 2009.Authors of this work explained that the stressors connected to financial income, organisation, inadequate work space, and unjust public criticism of their work are at the top of the hierarchical ranking by most of the doctors. Our research showed that exposure to inappropriate public criticism, overwork, and wrongly informed clients (users) are at the top of the stress scale of the doctors.

In his research Knežević B. and co. claim that by nurses/medical technicians, beside stressors of financial nature, at the top of the scale also have small number of workers, fear of danger and noxiousness at work such as ionizing radiation, cytostatic, infection, and pricking incidents. Our research showed that at the top of the scale by nurses/medical technicians are unrealistic expectations of the clients (users) and/or their family members, wrongly informed clients (users), and fear of possible infection.

Here we can see that in Knežević B. and co. we have stressors of financial nature, which is not the case with our research. Inappropriate criticism and fear of infection coincide as extremely stressful questions in both researches.

Conclusion

In this research, according to the results, it is confirmed that there is a significant difference between basic features of observed population with regard to the presence and level of stress. Causes of stress at work experienced by nurses/medical technicians and doctors employed at the Bureau of Emergency Medical of Canton Sarajevo are different, from moderate to high intensity, and it is confirmed that there is a statistically significant difference in experience and intensity of stress between doctors and nurses/medical technicians.

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SY level of amputation/versus CH chopart level dilemmas

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Abstract

SY level is amputation in level of ankle joint.

Ch level is ampuatation of front and middle part of foot with preserved calcaneus and talus. Treatmen of both type of patients demands pedantic ortophedic – technical treatment. Differencies in stump's is that SY level stump is stabile and 100% can be loaded, a stump after CH level is instabile. Within amputations during peace, where the talus and calcaneus are fully preserved, stump is instabile, heel is moving cranial, talus plunge forward and often became a part of support. It all happens beacuse of the overbalance of Achilles tendon, it is all happening beacuse the flexors of fornt and midlle part of foot are missing. Support is mainly on outer edge of the foot. Recomended procedures with tendon transplantation are trying to make balance between inner and outer edge of the foot, they are trying to make horisontal balance in foot during the support.

Stump load after the CH amputation is less than 50%, proff Baum- Gartner recomends Achille tendon elongation and primary arthrodesis for improvement of balance and stability in stump during the support. During the war time situation is even more changned in negative way. Beside that for SY level of amputation all the characteristic stay the same, at CH ampuattion it is often that just parts (usually ½ or less) of talus and calcaneus are reamaning. Stump like that is often more instabile than the CH stump during the war conditions, Muminagić recomends primary arthrodesis and elongation of Achilles tendon (Baum-Gartner procedure), primarni postponed suture (4-7 day), or secundary after 6 or more weeks after the infection is gone. ¨War¨ CH stump is more insuficient in teh manner of capacity and load. There is a dillema what ot decide in war time conditions and to preffer SY level of amputations. Our results have shown reamputation and sy level amputation are needed at most patients (beacuse of torpid ulceration at skin od instabile and deformated stump).

We have followed patients with Chopart amputation during 1992 – 1995 and during 15 years. Our experience show's that Chopart have advantage, but it is necessery to perform Baum – Gartner procedure during the first 6 weeks.

Key words: war amputation – Chopart – Syme – Dilemmas

Introduction

Syme amputation first time is performed 1854. By Baumgartner (1), it was performed by James Syme (1), profesor of Surgery in Edinburgh. Patient was a boy with a diagnosis of torpid osteomyelitis of tarsal bones. This amputation is indicatet at patients with unstatisfied results after the CH amputation or Pirogof/Spitzy, the at diabetic phlegmona's and with the patients who lost circulation in their foot.

Modern operative tehnique, unlike the clasical Syme amputation reserves cartilage of tibia's joint surface and as result there is a rounded stump, capable for 100% load, shorthening extremity (7 cm) (1). There have been noted a tries of tibia elongation with modern distractors (Ao, Ilizarov, etc...). Syme amputation can be made in two steps by Wagner (1).

- Egzarticulation of upper ankle,
- 6-8 weeks after the wound have healed, maleolus resection is following.

Ch amputation

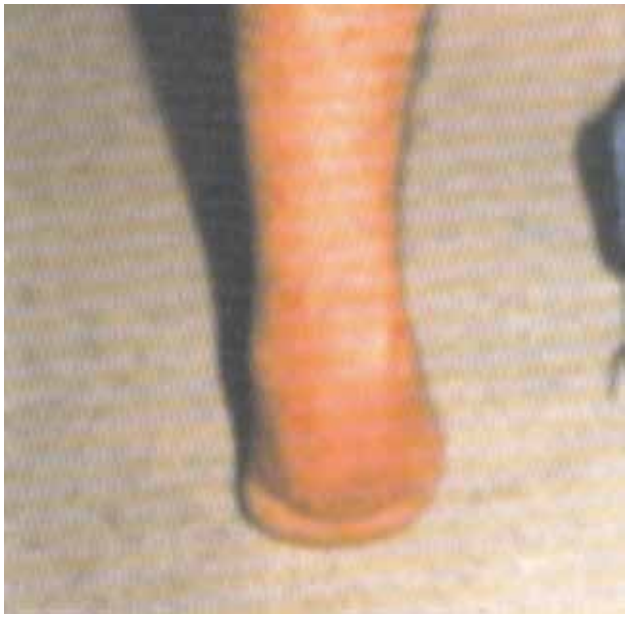
Level of amputation in line between talus and calcanus proximal in relation to distal, os cuboideum and os naviculare. Stump Inclined toward deformity, Achilles tendon pull heel, stump supination is stronger and as a result disabilites toward support and protetic – technical amputation.

Many authors have critics to this procedures (Kirbi and others 1981., Stöcker 1895). Beacues of the stump supination and foot equinose they suggested amputation on higher level – SY amputation.

Beacues of tendention to equinus deformation Wagner considered that Chopart amputation should be avoid. (1) Other authors as Burgeos (2), Baumgartner (1) considered that stump should be under the control and they make some suggestion's:

- Achille tendon elongation
- Transfer of m. tibialis anteriot tendon.
- Subtalar fusion
- Calcaneo – tibial arthrodesis vith verticalisation of calcaneus.

Figure 1. Syme amputation of the left shank



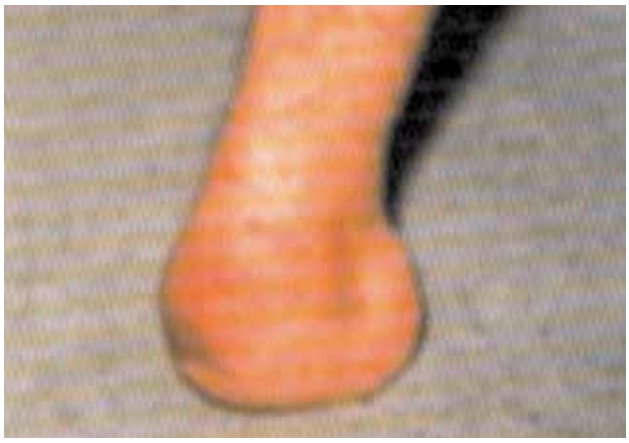


Figure 2. Chopart amputation: correct axis, a slight of the heel backwards

Pinzur 1986. (1) is recommending profilactic primmary cutting of Achilles tendon.

Parziale and Haftan (1988) and Christie and others (1980) (1) recommended primary tenodesis of m. tibialis antertior during the amputation so the horisontal position of stump can be achieved and stronger supination can be avodided. All this critics of CH amputations level are advicing amputation on higher level. In favor of supporters of CH amputation level, show the following attributes: (if the deformity is avoided and stump balance):

- Stump is capable to make support without prothesis
- Ekstremity does not lose on lenght
- Ankle is preserved
- Cosmetic effect
- Very big psyhcological plus effect.

Figure 3. Excellent position of the stump at wieght loading after Chopart amputation

Results

During the period 1992 – 1995 we have made 7 Syme amputation and 45 Chopart amputation. During the first years of War beacuse of mine injuries we made more 4 Chopart amputation. We have followed patients and stump behavior. Beacuse of stump instability we have made 5 more reamputtions. We have made it on higher level, Chopar level we have moved to Sy level (table 1.) During controled period we have made 19 correction (table 2.).

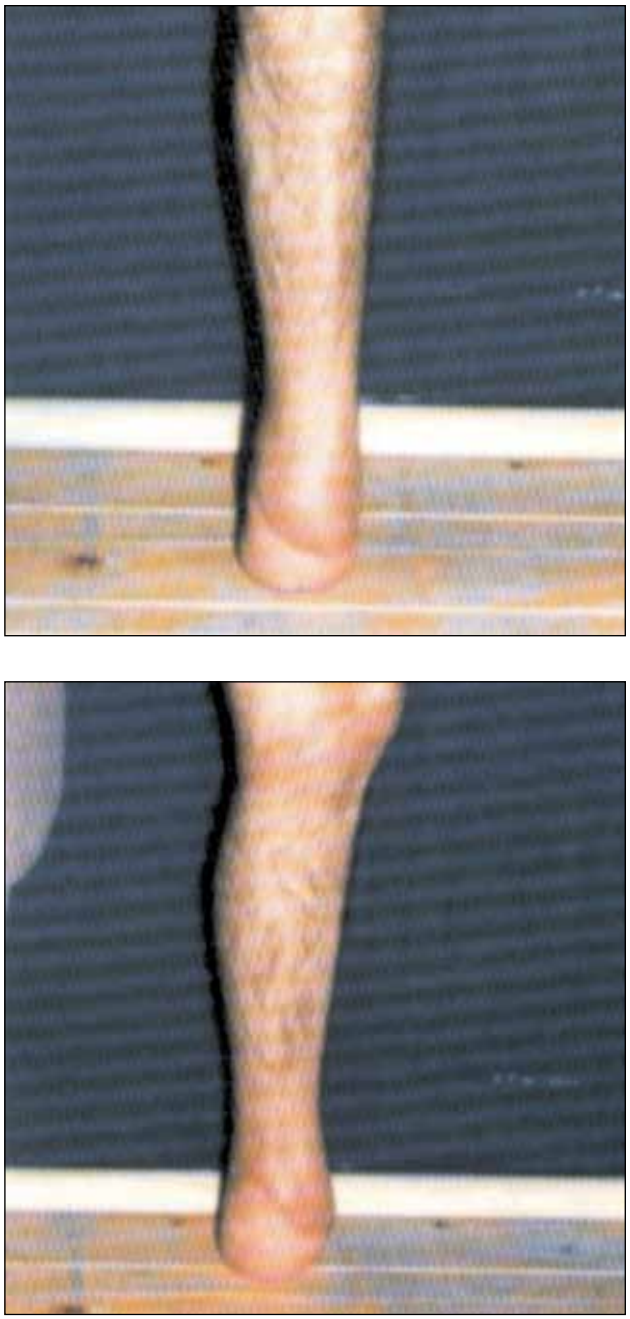


Figure 4. Chopart amuptation: there is no shift of the back foot axis

Table 1. Reamputations

Reamputation	Number of patients
Level of amputation – Chopart	
New level's – Sy amputation	5

Table 2. Corrections

Number of corrections	Number of patients
Elongation and Achilles tendon prolongation	12
Tibio – talus – calcaneus arthrodesis	7

Discussion

Number of reampuation at 49 patients, Chopart amputation is translated in Syme amputation at 5 patients (10.2%). Number of corrections is 19 (38%). 4 patients have instabile stump and support was on outer and front surface of stump. They have refused indicated operative tretmanet and correction. We can make conclusion that 28 patients have unfarovable stump, results were not good at 57% of patients. Best results we have achieved in cases where we have applied primary postopondes arthrodesis with Achilles tendon elongation (3). It is Baumgartner procedure from peace time conditions (1). We are publishing first experiences in war surgery. Very good stump can be made if we apply this method in second week after the primary amputation, or after the infection has gone. (3,4). Good result is aschieved if it is possible to make it 6 weeks postoperative. Otherwise beacuse of inflammatory adhesions very strong and hard to solve contractures can occur.

Conclusion

Considering our results we are giving advantare to amputation on Chopart level. We are advicing to perform Baumgartner operative procedure during the 6 weeks from injurie and primary amputation. Great advantage is also in that after the Chopart amputation there is no shortening of ekstremity unlike the Syme amputation where we have result of shortening for 7 cm.

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Angiographic evaluation of the dominance patterns of coronary circulation

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Abstract

The dominant artery is one that gives posterior descending artery and supply the inferior portion of the interventricular groove. The dominance can be: right, left and balanced (co-dominant) circulation with several subtypes. The aim of this study was to determinate the dominance patterns of the heart circulation on the angiograms and their represence on sex and age and to determinate their correlation with clinical consequences.

The study included 70 patients with ischemic heart disease (males 50, females 20, age between 33-78 years) who underwent coronary angiography in Heart Centre of the Clinical Center University of Sarajevo in period of 01.04.2011. to 01.04.2012., either for the symptoms of chest pain, angina pectoris etc. The angiograms were analyzed to determinate the dominance patterns of the heart circulation.

Angiograms of 70 patients showed the right dominant type in 50 (71,42%) cases, the left dominant in 7 (10%) cases and the balanced circulation in 13 (18,57%) cases. The most common type of coronary circulation is the right dominant by both sex. Males were majority in this study.. Majority of the patients were in their 5th and 6th decades of life. There is no significant difference in dominance pattern with age or sex. Correlation with clinical consequences was observed through the myocardial infarction and the type of coronary circulation. Myocardial infarction was determinated in patients with left dominant circulation most frequently than in right and balanced circulation.

The right dominant circulation is most common by bouth sex. Myocardial infarction is most common by males and by the left dominant circulation, where clinical consequences were worse and that explains the large area that is vascularisation by left coronary artery and the occlusion occurs most common on the left descending artery.

Key words: coronary dominance, coronary circulation, coronary angiography

Introduction

The heart is normally supplied by two coronary arteries: right coronary artery (RCA) and left coronary artery (LCA). Coronary arteries are known for their wide variations with regard to origin, course, termination and branching pattern. [(1)] There are many types of classification of coronary circulation. The first type was introduced by Banchi in 1904.The dominance can be: right, left and balanced (co-dominant) circulation with several subtypes. Whichever artery crosses the crux of the heart and gives off the posterior descending branches is considered to be the dominant coronary artery.[(2)]

In 63% of individuals, the RCA crosses the posterior interventricular groove and gives rise to the posterior descending branches (*right dominance*); in 10-15% the LCx artery crosses the interventricular groove and gives rise to branches to the posterior right ventricular surface *(left dominance*); and in the remaining 24%, the inferior interventricular septum is perfused by branches from both the distal RCA and the distal LCx artery (*codominance*). [(3)] Approximately 70% of the general popularition are right dominant, 20% are co-dominant, and 10% left dominant[(1,2,3,7)]. Some angiographic studies of the dominance pattern of coronary artery[(4,5,6, 10)] shows in approximately 85% cases right coronary predominance. The right coronary dominant and co-dominant pattern coronary arteries are more prevalent in these studies. Age and sex have no significant association with coronary dominance. Left dominance seems to be associated with higher mortality due to acute infarction and a higher incidence of arteriosclerosis.[(3,8,9)]

Coronary angiography allows detailed assessment of the arterial supply of the heart, and dominant patterns of heart circulation. The study of the coronary dominace would help both cardiac surgeons and radiologists in dealing better with the coronary heart disease. [11,12]

The aim of this study was to determinate the dominance patterns of the heart circulation on the angiograms and their represence on sex and age and to determinate their correlation with clinical consequences.

Patients and methods

The study included 70 patients with ischemic heart disease (males 50, females 20, age between 33-78 years) who underwent coronary angiography in Heart Centre of the Clinical Center University of Sarajevo in period of 01.04.2011. to 01.04.2012., either for the symptoms of chest pain, angina pectoris etc. The angiograms were analyzed to determinate the dominance patterns of the heart circulation. Some of these patients had diabetes mellitus.

Statistical analysis

The statistical analysis of the results was performed using Kolmogorow-Smirnow test. Using Kolmogorow-Smirnow test, the differences in the typy of arterial vascularisation established by coronary angiography were considered significant on the level $p<0,05$.

Results

Coronary angiographic analysis showed in 50 of 70 patients (71,42%) right coronary dominance, left dominance was found in 7 (10%) cases while balanced pattern was observed in 13 (18,57%) cases (Table 1, Figure 1,2,3). Kolmogorov-Smirnov test shows that the most common type of coronary circulation is the right dominant by both sex.

Figure 1. Coronary angiography in the left anterior oblique projection (LAO) showed the right type of coronary circulation

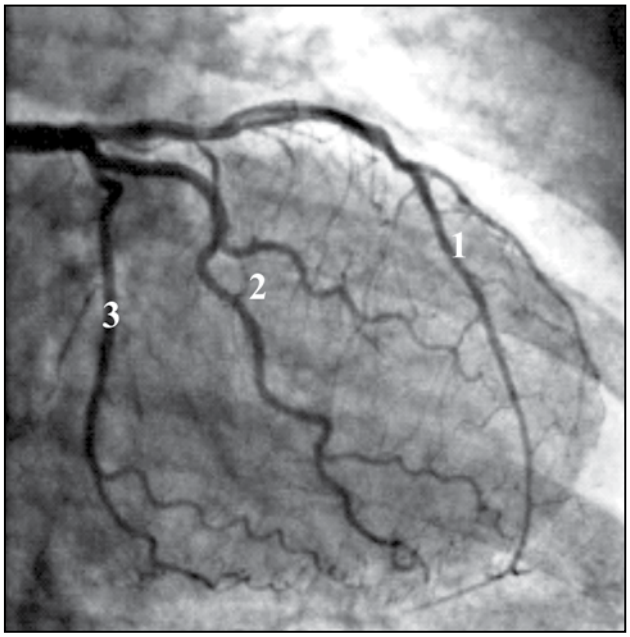

Figure 2. Coronary angiography in the left anterior oblique projection (LAO) showed the balanced type of coronary circulation (1. r. interventricularis anterior, 2. r. circumflexus, 3. a. coronaria dextra)

Table 1. Dominance patterns of coronary circulation

Dominance patterns			
Right dominance	**Left dominance**	**Balanced**	**Total (%)**
50 (71,42%)	**7 (10%)**	**13 (18,57%)**	**70 (100%)**

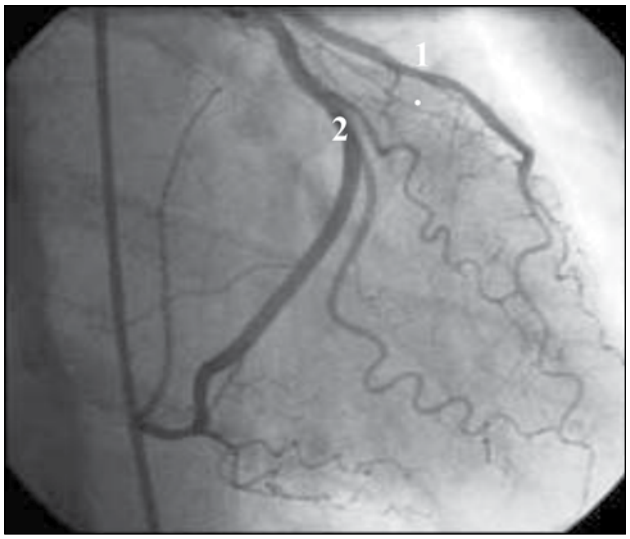

Figure 3. Coronary angiography in the left anterior oblique projection (LAO) showed the left type of coronary circulation (1. r. interventricularis anterior, 2. r. circumflexus).

Out of a total of 70 patients with coronary artery disease which underwent coronary angiography in Heart Centre of the Clinical Center University of Sarajevo, 50 were males while 20 were females. Majority of the patients were in their 5th and 6th decades of life. The age range was 33-78 years. The pattern of the coronary artery dominance with sex has been depicted in Table 2.

Table 2. Distribution of coronary dominance with sex (n=70)

Sex	Dominance pattern			Total
	Right dominance	Left dominance	Balanced	
Male	38 (76%)	4 (8%)	8 (16%)	50 (100,00%)
Female	12 (22%)	3 (6%)	5 (10%)	20 (100,00%)
Total	50	7	13	70

Kolmogorov-Smirnov test shows no correlations between sex and the type of coronary circulation.

Correlation with clinical consequences was observed through the myocardial infarction and the type of coronary circulation. Clinical consequences of coronary occlusion in our study were most serious in patients with left dominant circulation than in patients with right and balanced circulation.

The result of occlusion of coronary artery dependent on the type of arterial vascularization.

Myocardial infarction is most common by males and by the left dominant circulation, where clinical consequences were worse and that explains the large area that is vascularisation by left coronary artery and the occlusion occurs most common on the left descending artery.

Discussion

Because of the importance of the anatomy in the planning of coronary disease surgeries, the dominance of the circulation is a common theme for discussion in the literature. [1-11]

The current angiographic study indicates the frequency of coronary dominance in 70 patients with coronary artery disease. In our study, 71,42% of cases had right coronary dominance, 10% had left coronary dominance and 18,57% had co-dominant coronary circulation. There is no significant difference in dominance pattern with age or sex. The results of the study were compared with other authors and variation were noted.

This relationship between the type of arterial vascularisation found Hadžiselimović [3]and Rajković et al.[7] Similar to our study Rajković et al. on angiograms of 27 patients established the right coronary dominance in 74% cases, in 14,8% left coronary dominance and balanced type in 11, 2%.

The coronary arteries were examined by gross dissection in the study of coronary dominance by Das et al [1].Right dominance was found in 70%, left dominace was found in 18, 57%, while balanced pattern was observed in 11,43% hearts.

Fazlul et al.[2] in angiographic study described in 60.50% cases right coronary dominance, 19.50% had left coronary dominance and 20% co-dominant coronary circulation. There is no significant difference in dominance pattern with age or sex. Authors concluded that the right coronary dominant and co-dominant pattern coronary arteries are more prevalent in the population of Assam.

Higgins et al [4] the dominance of the coronary arterial system was determined angiographically in 75 adult patients with isolated aortic stenosis with or without insufficiency, 25 adult patients with pure aortic insufficiency, 51 adult patients with combined aortic stenosis and mitral valve disease, and 44 children with bicuspid aortic valves. There was an unusually high incidence of left dominance in adults with isolated aortic stenosis (36%) and in children with bicuspid aortic valves (56.8%). These findings suggest the existence of

a variant developmental complex consisting of a bicuspid aortic valve and reversal of dominance of the coronary arterial system.

Shan K [5]in the study of coronary predominance in 100 human hearts shows in 82% cases right coronary predominance and in 17% cases left coronary predominance. Similar results showed a posmortem morphological study by Hussain et al.[6]

Ozturk et al.[11] angiographically determined the different vascularization patterns of the posterior interventricular sulcus with coronary CT angiography. Authors observed that the circulation was right dominant in 310 (87.1%) of the 356 cases, the left dominant in 34 (9.5%), and balanced in 12 (3.4%) cases. Loukas et al. [12] in their study provide more definitive information on the vessels with myocardial bridges and the relationship between the presence of bridges and coronary dominance. Authors concludes that the presence of bridges appeared to be related to coronary dominance, especially in the left coronary circulation.In this study forty-six (66.6%) of the hearts with bridges were left dominant, seventeen hearts (24.6%) were right dominant and the remaining six hearts were co-dominant. The possible clinical implications of myocardial bridging may vary from protection against atherosclerosis to systolic vessel compression and resultant myocardial ischaemia.

Our results showed that the dominance pattern of hearts has important clinical significance. Left dominance was found to have significantly higher mortality than right dominance and mixed types. Dominance also showed a role in left anterior descending (LAD) artery stenosis. It was observed that in left dominance, the LAD usually wraps around the apex of the heart, supplying major portion of myocardium. In contrast, in right domimance, it was the posterior ineterventricular branch of the right coronary artery that supplied most of the myocardium. As such, lesions in LAD would have more profound clinical importance in a left dominant heart than in a right dominant one.[1,8,9,11,12]

Dominance also plays an important role in inferior infarcts of the heart. The dominant RCA usually supplies the atrioventricular (AV) node. Therefore an inferior wall infarct caused by occlusion of the RCA will have higher risk of AV block.

Present study reported higher percentages of right dominance (71,42% of cases) and no significant difference in dominance pattern with age or sex.

Clinical consequences of coronary occlusion in our study were most serious in patients with left dominant circulation than in patients with right and balanced circulation.

The results of the study prove regional variations in dominance pattern which should always be borne in mind for better cardiac care.

Conclusions

- The most common type of coronary circulation is the right dominant by both sex. The right dominant type was observed in 50 (71,42%) patients, the left dominant in 7 (10%) cases, and the balanced circulation in 13 (18,57%).
- There is no significant difference in dominance pattern with age or sex. Out of a total of 50 males with coronary artery disease the right dominance were found in 38 (76%) cases, the left dominance in 4 (8%) cases, while balanced were established in 8 (16%) cases. Out of total of 20 females right dominance were established in 12 (22%) cases, left dominance in 3 (6%) cases, and balanced in 5 (10%) cases.
- Myocardial infarction is most common by males and by the left dominant circulation, where clinical consequences were worse and that explains the large area that is vascularisation by left coronary artery and the occlusion occurs most common on the left descending artery.

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Is Hyperprolactinemia a risk factor for Pulmonary Thromboembolism (PTE) in patients treated with Antipsychotic Drugs?

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Abstract

Introduction: The one of the most serious adverse effects of antipsychotic drug treatment is hyperprolactinemia, which is mediated by the dopamine-blocking action. In psychiatric practice this problem is often ignored. The findings of the conducted studies suggest that hyperprolactinemia is a potentional risk factor for pulmonary tromboembolism (PTE) in patients treated with antipsychotic drugs and that the thrombogenic effect is presented through enhanced platelet reactivity. Clinicians and patients need the information about risks and benefits of these drugs before they start antipsychotic drug treatment.

Aims: The aim of this study was to describe socio-demographic and clinical characteristics of PTE cases which were treated with antipsychotic drugs.

Material and methods: The retrospective study was conducted in the period from October 2010 to November 2011 at the Department of Psychiatry of Clinical Center University of Sarajevo and as a source of data we used medical records. The study included seven schizophrenic patients treated with antipsychotic drugs and who were diagnosed as clinically relevant PTE cases. We analyzed socio-demographic and clinical characteristics.

Results: Out of seven patients, six were females. The median of age for females was 55.5 years (IQR=52.5 to 61.5) and one male was 31 years. The specific incidence rate was 15.3 cases/1 000 schizophrenic patients hospitalized during a specified period of time (31.5/1 000 for females, 3.7/1 000 for males). The median of length of treatment with antipsychotic drugs was 14 years (IQR=10 to 23). The median of length of hospitalization was 37.0 days (IQR=7.0 to 47.0). Chlorpromazine or other phenothiazines had been prescribed in three patients, haloperidol in four patients and atypical antipsychotic drugs such as: olanzapine, clozapine and risperidone in six patients. The one patient had taken more than two antipsychotic drugs. Hyperprolactinemia was found in five females (Me=1072.0 mIU/L; IQR= 814.5 do 3537.0) and one male had the prolactine level of 1208.0 mIU/L.

Conclusion: The female schizophrenic patients have higher specific incidence rate of PTE. Clinicians must be very careful about antipsychotic drug treatment and should evaluate level of prolactine because vascular risk factors may interact with antipsychotics in terms of increasing the risk of PTE.

Key words: Hyperprolactinemia, Pulmonary Thromboembolism (PTE), Typical and Atypical Antipsychotic Drugs

Introduction

While extremely serious, a venous and pulmonary thromboembolism are rare conditions, but life threatening illnesses. In a large primary care population there was an association between the use of antipsychotic drugs and a risk of venous (VTE) and pulmonary thromboembolism (PTE). An annual incidence is more than 1/1 000 persons and a mortality rate is above 15% in the first three months after the diagnosis (1). In psychiatric practice this problem is often ignored. The risk factors for development of deep venous thrombosis (DVT) and PTE during medical hospitalization include: congenital factors (i.e. hereditary thromboembolia like Factor V Leiden, prothrombin deficiency) and acquired factors (advanced age, obesity, former DVT or PTE, surgery, trauma, neoplasms, heart, kidney and bowel disease, estrogen hormone therapy, immobilisation). The association between conventional antipsychotics with PTE and DVT was investigated in eight observational studies. Two studies suggest a posi-

tive association between conventional antipsychotics and PTE. These studies were conducted over a small number of patients (2,3). The other large stuides support the association between antipsychotic drugs with PTE and DVT due to conventional antipsychotics (4,5,6,7,8). A strong association showed especially high potency of antipsychotics such as haloperidol (6,7). It is possible that individual vascular risk factors may interact with antipsychotics on increasing the risk of DVT and PTE. There is a need to understand such mechanism in order to identify those patients who may be at the highest risk to developt tromboembolism (9). Clozapine, an atypical antipsychotic used against positive and negative symptoms of schizophrenia has been associated with PTE. The mechanism by which clozapine can induce thromboembolism is unclear. The increased risk was strongly marked among new users and those who were prescribed atypical antipsychotic drugs (Seroquel, Abilify, Solian, Lonasen and Risperidal). The older antipsychotic drugs include Thioridazine, Prolixin and Haldol (9). The highest risk, nearly fourfold, was associated with quetiapine (Seroquel). Risperidon is an atypical antipsychotic drug used to treat a number of psychiatric diseases, such as schizophrenia, schizoaffective disorder, bipolar disorders and irritability in children with autism. A possible association between risperidone with PTE and DVT has been described (10). In the past decade the single most common cause of the withdrowal or restriction of the use of drugs that have already been marketed has been the prolongation of the QT interval associated with polymorphic ventricular tachycardia, or *torsade de pointes* which can be fatal. Drug–induced sedation, obesity and antiphospholipid antibodies are leading to increased activity in the coagulation system. An association of thromboembolic complications with conventional agents, including chlorpromazine, was suggested more than 20 years ago. *Zornberg and Jick* have also reported that low-potency of antipsychotic drugs, such as chlorpromazine and thioridazine, are strongly associated with VTE than the high-potency antipsychotic drugs, such as haloperidol. Recently, thromboembolic complications have been reported with clozapine, an atypical antipsychotic drug (6,7,11,13).

Materials and methods

The retrospective study was conducted in the period from October 2010 to November 2011 at the Department of Psychiatry of Clinical Center University of Sarajevo and as a source of data we used medical records. The study included seven schizophrenic patient treated with antipsychotic drugs and diagnosed as clinically relevant PTE cases. We analyzed socio-demographic and clinical characteristics. We calculated the specific incidence rate according to the formulas: the number of new PTE cases that occurred during a specified period of time/the total number of schizophrenic patients treated with antipsychotic drugs and hospitalized during that period of time x 1 000. The results are expressed as median and interquartile range (IQR). In the case of categorical variables, counts and percentages were reported. Statistical analysis was performed by using the Statistical Package for the Social Sciences (SPSS Release 19.0; SPSS Inc., Chicago, Illinois, United States of America) software.

Results

Out of seven patients, six were females. The median of age for females was 55.5 years (IQR=52.5 to 61.5) and one male was 31 years. The specific incidence rate was 15.3 cases/1 000 schizophrenic patients hospitalized during a specified period of time (31.5/1 000 for females, 3.7/1 000 for males). The median of length of treatment with antipsychotic drugs was 14 years (IQR=10 to 23). The median of length of hospitalization was 37.0 days (IQR=7.0 to 47.0). Chlorpromazine or other phenothiazines had been prescribed in three cases, haloperidol in four, and atypical antipsychotic drugs such as olanzapine, clozapine and risperidone in six patients. The one patient had taken more than two antipsychotic drugs *(Table 1)*. The paranoid schizophrenia was diagnosed in five patients, catatonic schizophrenia and nondifferentiated schizophrenia in two cases, respectively. At the beginning of hospitalization patients were afebrile, normotensive, without paradoxal pulse. They were oriented in the time, place and to other persons. The Complete blood count (CBC) and chemistry panel were normal. Two days after hospitalization, in two cases, D-dimer was elevated at 7.2 mg/L (normal range up to 0.5); the

Table 1. Psychiatric profile of PTE cases associated with Antipsychotic Drugs (n=7)

Case no.	Age (years)	Gender	Diagnosis	DNT (years)	LOH (days)	APD (daily doses-mg)		
						Phenothiazines	SDA	Butyrophenones
1.	31	M	PS	3	37	CH (300)	OL (10)	HPD (15)
2.	58	F	PS	13	32	TH (75)		HPD (15)
3.	51	F	NS	10	37		CL (300) RI (4)	
4.	53	F	KS	22	6	PH (5)	CL (300)	
5.	53	F	PS	23	47		CL (300)	HPD (15)
6.	63	F	PS	28	82		CL (300)	HPD (50)
7.	61	F	PS	14	7		CL (200)	

M male; F female; DNT duration of neuroleptic treatment; LOH length of hospitalization; APD antipsychotic drugs; SDA serotonine-dopamine antagonist; PS, paranoid schizophrenia; NS, nondifferentiated schizophrenia; KS, catatonic schizophrenia; CH chlorpromazine; TH thioridazine; PH phluphenazine; OL olanzapine; CL clozapine; RI risperidone; HPD haloperidole;

Table 2. Specific and non-specific indicators of inflammation and measures of the pathway of coagulation

Case no.	WBC (x 10^9/L)	Fibrinogen (g/L)	CRP (mg/L)	INR (sec.)	APTT (sec.)
1.	18,2	3,2	32,0	1,22	103,5
2.	13,9	5,3	42,0	1,25	40,7
3.	16,7	6,4	58,0	1,13	25,5
4.	11,8	6,1	20,0	3,38	105,5
5.	8,7	3,6	56,0	1,76	36,9
6.	23,0	4,1	130,3	6,02	76,1
7.	17,2	6,5	24,6	1,12	24,5

WBC White Blood Cell; INR International Normalized Ratio; APTT Activated Partial Thromboplastin Time, CRP C-reactive protein

Table 3. Results of diagnostic procedures

Case no.	Frequency (heart rate)	SBP (mmHg)	DBP (mmHg)	T-waves	D-dimer (mg/L)	Chest X-ray	spiral CT
1.	115	140	90	38,2	56,0	(-)	(+)
2.	100	130	50	38,0	2,8	(-)	(+)
3.	100	140	90	39,2	12,5	(-)	(+)
4.	75	100	60	37,5	4,0	(-)	(+)
5.	100	120	80	37,3	710,0	(-)	(+)
6.	120	170	100	38,2	8,3	(-)	(+)
7.	103	110	70	37,2	9,6	(-)	(+)

SBP systolic blood pressure; DBP diastolic blood pressure; (-) negative; (+) positive;

other cases had elevated D-dimer after several days. Negative Chest X-ray was determinated in all cases. The Spiral Computed Tomogram (spiral CT) of chest showed massive bilateral thromboembolism in four patients and thromboembolism of terminal part of the left pulmonary artery, segmental branch of the left pulmonary artery and right lower pulmonary vein, in three patients, respectively *(Table 3)*.

Comorbidity was determinated, four patients had dyslipidemia and two patients had diabetes mellitus. Doppler ultrasound of the lower extremities was negative for DVT *(Table 4)*.

Table 4. Characteristics of PTE cases associated with Antipsychotic Drugs (n=7)

Case no.	Dyslipidemia	Diabetes mellitus	Site of PTE	DVT
1.	(-)	(-)	B	(-)
2.	(+)	(+)	B	(-)
3.	(+)	(-)	B	(-)
4.	(+)	(-)	L	(-)
5.	(+)	(+)	B	(-)
6.	(-)	(-)	L	(-)
7.	(-)	(-)	R	(-)

DVT deep venous thrombosis; B billateral; R right; L left; (-) negative; (+) positive

Table 5. Hormonal status of PTE cases

Case no.	Thyroid hormones			Prolactine
	T_3	T_4	TSH	
1.	1,9	51	11,5	1208,0
2.	1,7	133	2,2	3914,0
3.	1,6	82	3,6	3160,0
4.	1,2	150	3,3	1072,0
5.	2,4	78	3,1	356,0
6.	0,7	95	0,2	716,0
7.	9,5	87	11,6	913,0

T_3 triiodothironine; T_4 thyroxin; TSH thyroid-stimulating hormone or thyreotropin

Hyperprolactinemia was found in five females (Me=1072.0 mIU/L; IQR= 814.5 do 3537.0) and one male had the prolactine level of 1208.0 mIU/L.

Discussion

The absolute individual risk of VTE for a subject taking antipsychotics is low (11). Immobilization is regarded as an important risk factor in persistant sitting position (12). In our study one female patient was immobilized for three days in bed. We were very careful because vascular risk factors may interact with antipsychotics in terms of increasing the risk of thromboembolism. The patients in our study did not have a history of fevers or upper respiratory tract infection, pneumonia, coagulation disorders and long travel. One case had catatonia and one female had Neuroleptic malignant syndrome. PTE was more often reported with the use of antipsychotic drug olanzapin than with other drugs. This is disproportional reporting, since the association that was obtained was based on incomplete clinical data. The results should be considered as pulmonary and interpreted cautiously (14). Clinical study of *Parkins et al.*, *2003.* showed the results for conventional antipsychotics that were consistent with previous studies of non fatal VTE and fatal PTE in 75 cases for period of eight years (7). The study of *Hippisley-Cox et al., 2010.* collected data on 25.532 people who developed DVT or PTE between 1996 and 2007 (9). The study' authors found that people who took antipsychotic drugs for two years before developing a DVT or PTE had 32% higher risk of developing the conditions compared with those who were not taking these drugs. The most notorious hormonal adverse effect of antipsychotic drugs is hyperprolactinemia, which is mediated by the dopamine-blocking action of these agents. *Wallaschofski et al.* suggest that hyperprolactinemia is an important, new risk factor for PTE in patients on antipsychotic drugs and that the thrombogenic effect is mediated through enhanced platelet reactivity (15). This adverse effect is also seen in male patients, but is highly marked in female patients (16). Our results showed the same, all patients had a high level od prolactine (males and females). All patients showed sinus tachycardia at 105 to 120 beats per minute, with nonspecific T-wave changes, however, the patients were not in acute distress and did not complain of any chest pain or shortness of breath. Spiral CT scan demonstrated unilateral or billateral PTE. At magnetic resonance imaging (MRI) of the brain masive thromboembolism was detected, in some cases unilateral and in some billateral.

Conclusions

The female schizophrenic patients have higher specific incidence rate of PTE. Clinicians must be very careful about antipsychotic drug treatment and evaluate levels of prolactine because vascular risk factors may interact with antipsychotics in terms of increasing the risk of PTE.

Prophylaxis

Screening of patients for additional risk factors of PTE seems advisible to identify those patient that would benefit from prophylaxis. Some authors suggest anticoagulant therapy during immobility due to neuroleptic malignant syndrome for such patients. Further technical investigations such as ventilator-perfusion scan or spiral CT of the chest in diagnosis of PTE is neccessary.

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